

nationalgrid			
Closure: US Sanction Paper			
Title:	Data Visualization Evolution	Sanction Paper #:	USSC-18-232C
Project #:	INVP 4768	Sanction Type:	Closure
Capex #:	S007892		
Operating Company:	National Grid USA Service Co.	Date of Request:	7/30/2019
Author:	Marullo, Frank	Sponsor(s):	Gilbert, John Global Head IS Service De
Utility Service:	IT	Project Manager:	Marullo, Frank

Executive Summary

This paper is presented to close INVP 4768. The total spend was \$2.640M. The original sanctioned amount for this project was \$2.868M at +/- 10%.

Project Summary

This project has been designed to give National Grid a strategic and economic advantage by providing the tools, processes and expertise needed for transforming raw data into meaningful actionable insights. This project will allow National Grid to partner with a vendor to allow our data visualization efforts to evolve on an experienced based approach and to provide continued services in support of developing new capabilities, scaling National Grid's technology ecosystem to deliver highly effective technical support.

Schedule Variance Table

Schedule Variance	
Project Grade - Ready to use Date	4/30/2019
Actual Ready to use Date	1/25/2019
Schedule Variance	0 year(s), 3 month(s), 5 day(s)

Schedule Variance Explanation

Due to efficiencies to improve the schedule, largely due to adopting agile methodologies, the project ended early, resulting in labor and overhead savings

Cost Summary Table

Project Sanction Summary (\$M)				
Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under	
Capex	2.360	2.700	0.340	
Opex	0.280	0.158	(0.122)	

Removal	0.000	0.000	0.000
Total	2.640	2.858	0.218

Cost Variance Analysis

The total sanctioned amount for the project is 2.868M with an original go live date at the end of the first quarter in FY20. The project was completed ahead of schedule and under budget with an actual go live date in January 2019.

Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)

Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
	Capex	2.360	2.700	0.340
	Opex	0.280	0.158	(0.122)
	Removal	0.000	0.000	0.000
	Total	2.640	2.858	0.218

Project Sanction Summary (\$M)

	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Total	Capex	2.360	2.700	0.340
	Opex	0.280	0.158	(0.122)
	Removal	0.000	0.000	0.000
	Total	2.640	2.858	0.218

Improvements / Lessons Learned

Project workbook does not support agile process.

Gate submission requirements are not applicable when taking over a project that is inflight and in development phase.

Forecasting financial needs on this project was difficult as Agile iterations were impossible to predict and plan for because iterations were determined through an Ad Hoc basis based on business needs.

Closeout Activities

ACTIVITY	COMPLETED
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused material have been returned	<input checked="" type="radio"/> Yes <input type="radio"/> No
All as-builts have been completed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All lessons learned have been entered appropriately into the lesson learned database	<input checked="" type="radio"/> Yes <input type="radio"/> No

Statement of Support

Department	Individual	Responsibilities
Business Department	Gilbert, John	Business Representative
Business Partner (BP)	Brodsky, Edward M.	Relationship Manager
Program Delivery Management (PDM)	Towne, Thomas A. (ITNY)	Program Delivery Director
IT Finance	Zacchilli, Denise	Manager
IT Regulatory	DeMauro, Daniel J.	Director
Digital Risk and Security (DR&S)	Shea, William	Manager
Service Delivery	Lyba, Svetlana	Manager
Enterprise Architecture	Cronin, Daniel	Manager
Enterprise Portfolio Management	Cronin, Daniel	Analyst

Reviewers

Function	Individual
Regulatory	Mancinelli, Lauri A.
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Smith, Amy
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego

Decisions

I approve this paper.

Signature DLH. Campbell

Date 8/8/19

David H. Campbell, Vice President US Treasury, USSC Chair



Re-sanction Request

Title:	Time Entry and Approval Mobility Enablement	Sanction Paper #:	USSC-17-302 v3
Project #:	INVP 4779 Capex: S007730	Sanction Type:	Re-sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	1/8/2019
Author / NG Representative:	Anil Garg / Ella Weisbord	Sponsor:	Chris McConnachie, VP Finance Services
Utility Service:	IT	Project Manager:	Samir Parikh

1 Executive Summary

This paper requests re-sanction of INVP 4779 in the amount of \$4.963 with a tolerance of +/- 10% for the purposes of Full Implementation.

This re-sanction amount is \$4.963M broken down into:

\$4.360M Capex

\$0.603M Opex

\$0.000M Removal

Note the originally requested sanction amount of \$4.405M

2 Resanction Details

2.1 Project Summary

This project allows National Grid to improve its end-to-end time entry and time approval process across the US organization. Through the deployment of mobile technology, National Grid will be able to eliminate its current manual time capture processes, and will enable supervisors to efficiently review and approve employee time entry. In addition, this project will benefit National Grid by improving the quality of data; the timeliness of time entry by eliminating the lag inherent in paper-based time entry process; efficiency of time approval process and improving overall payroll processing time by reducing data entry errors.



Re-sanction Request

2.2 Summary of Projects

Project Number	Project Title	Estimate Amount (\$M)
INVP 4779	Transform Timekeeping and Employee Time Entry	4.963
Total		4.963

2.3 Prior Sanctioning History

Describe previous sanctions for the projects included in the scope of this paper (Newest to Oldest).

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Sanction Type	Sanction Paper #	Potential Investment Tolerance
1/10/2018	USSC	4.405M	\$4.400M	Sanction	INVP4779	10%
9/13/2017	USSC	3.047M	\$4.100M	Partial	INVP4779	25%

Over / Under Expenditure Analysis

Summary Analysis (\$M)	Capex	Opex	Removal	Total
Resanction Amount	4.360	0.603	0.000	4.963
Latest Approval	3.865	0.540	0.000	4.405
Change*	0.495	0.063	0.000	0.558

*Change = (Re-sanction – Amount Latest Approval)



Re-sanction Request

2.4 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
IT Investment Plan FY18 - 22	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> N/A	4.963

2.5 If cost > approved Business Plan how will this be funded?

Re-allocation of budget from the US Finance to the IT business and within the IS business has been managed to meet jurisdictional budgetary, statutory and regulatory requirements.

2.6 Cost Summary Table

Project Number	Project Title	Project Estimate Level (%)	Spend (\$M)	Prior Yrs	Current Planning Horizon						Total
					Yr.1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
INVP 4779	Transform Timekeeping and Employee Time Entry	Est Lvl +/- 10%	CapEx	2.855	1.505	0.000	0.000	0.000	0.000	0.000	4.360
			OpEx	0.373	0.230	0.000	0.000	0.000	0.000	0.000	0.603
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	3.228	1.735	0.000	0.000	0.000	0.000	0.000	4.963



Re-sanction Request

2.7 Project Budget Summary Table

Project Costs per Business Plan

	Prior Yrs (Actual)	Current Planning Horizon (\$M)						
		Yr. 1 2018/19	Yr. 2 2019/20	Yr. 3 2020/21	Yr. 4 2021/22	Yr. 5 2022/23	Yr. 6 + 2023/24	Total
\$M								
CapEx	2.855	1.010	0.000	0.000	0.000	0.000	0.000	3.865
OpEx	0.373	0.167	0.000	0.000	0.000	0.000	0.000	0.540
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	3.228	1.177	0.000	0.000	0.000	0.000	0.000	4.405

Variance (Business Plan-Project Estimate)

	Prior Yrs (Actual)	Current Planning Horizon (\$M)						
		Yr. 1 2018/19	Yr. 2 2019/20	Yr. 3 2020/21	Yr. 4 2021/22	Yr. 5 2022/23	Yr. 6 + 2023/24	Total
\$M								
CapEx	0.000	(0.495)	0.000	0.000	0.000	0.000	0.000	(0.495)
OpEx	0.000	(0.063)	0.000	0.000	0.000	0.000	0.000	(0.063)
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	(0.558)	0.000	0.000	0.000	0.000	0.000	(0.558)

2.8 Drivers

2.8.1 Detailed Analysis Table

Detail Analysis	Over/Under Expenditure?	Amount (M's)
Key variation 1 –	<input checked="" type="checkbox"/> Over <input type="checkbox"/> Under	\$0.453M
Key variation 2 –	<input checked="" type="checkbox"/> Over <input type="checkbox"/> Under	\$0.105M



Re-sanction Request

2.8.2 Explanation of Key Variations

1. Project go-live was delayed from Q4 of FY18 into Q1 of FY19. This delay was due to a mandate from the Finance organization to freeze all changes leading up to the fiscal year end close and resulted in increased labor and SAP environment hosting costs. In addition, the final project deliverable was delayed by several months due to commercial delays with SAP. We were unable to execute a contract due to updates that were required to satisfy General Data Protection Regulation (GDPR) requirements.
The cost of additional labor and hosting cost is \$.453M.
2. Verizon has overcharged by \$.105M for iPad cellular service when the iPads were requested in a deactivated state. The team is currently in negotiation with Verizon to recover the cost. The refund will be applied to project costs as a credit.

2.9 Key Milestones

Milestone	Target Date: (Month Year)
Start Up	June 2017
Partial Sanction	September 2017
Begin Requirements and Design	September 2017
Project Sanction	January 2018
Begin Development and Implementation	December 2017
Project Re-sanction	January 2019
Move to Production / Last Go Live	April 2018
Project Closure	March 2019

2.10 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
March 2019	Project Closure Sanction



Re-sanction Request

3 Statements of Support

3.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Department	Individual	Responsibilities
Business Department	Thomas LaVeck	Business Representative
Program Delivery Management (PDM)	Narayan Devireddy	Head of PDM
Business Partner (BP)	Joel Semel	Relationship Manager
Program Delivery Management (PDM)	Samir Parikh	Program Delivery Director
IT Finance	Michelle Harris	Manager
IT Regulatory	Dan Demauro	Director
Digital Risk and Security (DR&S)	Elaine Wilson	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director

3.2 Reviewers

The reviewers have provided feedback on the content/language of the paper

Function	Individual
Regulatory	Harvey, Maria
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Currie, John
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego



Re-sanction Request

4 Decisions

I:

- (a) APPROVE this paper and the investment of \$4.963M and a tolerance of +/-10% for the purposes of Implementation
- (b) NOTE that Samir Parikh is the Project Manager and has the approved financial delegation.

Signature.....Date.....

David H. Campbell, Vice President ServCo Business Partnering, USSC Chair



Re-sanction Request

5 Appendices



US Sanction Paper

Title:	Supervisor Enablement iPad Roll-out	Sanction Paper #:	USSC-18-203
Project #:	INVP 4811 S007851	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	4/2/2019
Author:	Ashok Vallapu/ William Myles	Sponsor:	Tatiana Roc, VP Supervisor Enablement
Utility Service:	IT	Project Manager:	Ashok Vallapu/ William Myles

1 Executive Summary

1.1 **Sanctioning Summary**

This paper requests sanction of INVP 4811 in the amount of \$1.509M with a tolerance of +/- 10% for the purposes of Full Implementation

This sanction amount is \$1.509M broken down into:

\$0.963M Capex

\$0.546M Opex

\$0.000M Removal

1.2 **Project Summary**

This project will deliver tools and capabilities which will enable field supervisors to spend more time in the field supervising their crews. Many of the systems and capabilities in use today require field supervisors to spend a portion of their day in the office where they have access to the information and applications needed to do their job. This investment will extend the office to the field, providing access to many of the systems and capabilities so that supervisors can perform the work remotely while working in the field with their crews. This will be done utilizing iPads with new applications and capabilities which will provide remote access to the National Grid network in addition to remote application functionality.

1.3 **Summary of Projects**

Project Number	Project Type (Elec only)	Project Title	Estimate Amount (\$M)
INVP 4811	Project Type	Supervisor Enablement iPad Roll-out	1.509
Total			1.509

US Sanction Paper**1.4 Associated Projects**

INVP 4751 Electric Supervisors Enablement Pilot for \$0.125 USD

1.5 Prior Sanctioning History

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Sanction Type	Potential Investment Tolerance
5/9/18	USSC	\$0.725M	2.367M	Partial	25%

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
December 2019	Project Closure Sanction

1.7 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input type="radio"/> Mandatory <input type="radio"/> Policy- Driven <input type="radio"/> Justified NPV <input checked="" type="radio"/> Other	<p>This investment will increase the Field Supervisors ability to do their job and spend more time in the field supervising their crews. This will be accomplished by enabling field access to much of the information and systems they can only access now while in the office.</p>

US Sanction Paper**1.8 Asset Management Risk Score**Asset Management Risk Score: 21**Primary Risk Score Driver:** (Policy Driven Projects Only)
☐ Reliability

 ☐ Environment

 ☐ Health & Safety

 ☒ Not Policy Driven
1.9 Complexity Level
☐ High Complexity

 ☐ Medium Complexity

 ☒ Low Complexity

 ☐ N/A
Complexity Score: 18**1.10 Process Hazard Assessment**

A Process Hazard Assessment (PHA) is required for this project:

☐ Yes

 ☒ No
1.11 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
IT Investment Plan FY20 - 24	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA	0.205

1.12 If cost > approved Business Plan how will this be funded?

Re-allocation of budget within the IS business has been managed to meet jurisdictional budgetary, statutory and regulatory requirements.

1.13 Current Planning Horizon

US Sanction Paper

\$M	Prior Yrs	Current Planning Horizon						Total
		Yr. 1 2019/20	Yr. 2 2020/21	Yr. 3 2021/22	Yr. 4 2022/23	Yr. 5 2023/24	Yr. 6 + 2024/25	
CapEx	0.403	0.560	0.000	0.000	0.000	0.000	0.000	0.963
OpEx	0.249	0.297	0.000	0.000	0.000	0.000	0.000	0.546
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.652	0.857	0.000	0.000	0.000	0.000	0.000	1.509

1.14 Key Milestones

Milestone	Target Date: (Month Year)
Start Up	March 2018
Partial Sanction	May 2018
Begin Requirements and Design	June 2018
Project Sanction	March 2019
Begin Development and Implementation	April 2019
Begin User Acceptance Testing	July 2019
Move to Production / Last Go Live	September 2019
Project Closure	December 2019

1.15 Resources, Operations and Procurement

Resource Sourcing			
Engineering & Design Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Construction/Implementation Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Resource Delivery			
Availability of internal resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Availability of external resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Operational Impact			
Outage impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Procurement Impact			
Procurement impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green

**US Sanction Paper****1.16 Key Issues (include mitigation of Red or Amber Resources)**

N/A

1.17 Climate Change

Contribution to National Grid's 2050 80% emissions reduction target:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative
Impact on adaptability of network for future climate change:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative

1.18 List References

N/A



US Sanction Paper

2 Decisions

I:

- (a) APPROVE this paper and the investment of \$1.509M and a tolerance of +/-10% for the purposes of Requirements, Design, Development, and Implementation
- (b) APPROVE the run-the-business (RTB) of \$0.080M (per annum) for 5 years.
- (c) NOTE that William Myles is the Project Manager and has the approved financial delegation.

Signature.....Date.....

David H. Campbell, Vice President ServCo Business Partnering, USSC Chair



US Sanction Paper

3 Sanction Paper Detail

Title:	Supervisor Enablement iPad Roll-out	Sanction Paper #:	USSC-18-203
Project #:	INVP 4811 S007851	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	4/2/2019
Author:	Ashok Vallapu / William Myles	Sponsor:	Tatiana Roc, VP Supervisor Enablement
Utility Service:	IT	Project Manager:	Ashok Vallapu / William Myles

3.1 **Background**

Field Supervisors currently spend a good portion of their time in the office where they have access to the systems and information they need to do their job. This leads to less time they have available to spend out in the field supervising their crews. There is a need to extend these tools and applications used by field supervisors in office, out to field locations, as well as provide new ones, so supervisors can spend more time doing their primary job supervising the work force.

A pilot of the use of iPads with new enabling capabilities in the field demonstrated that they can facilitate supervisors to spend more time in the field with an expanded ability to gain additional information to quickly react and make decisions while out in the field. The use of the iPads and capabilities has been an overwhelming success and there is a demand for full implementation and enhance the offering.

3.2 **Drivers**

This project will roll out latest version of iPads to all Gas and Electric supervisors and make available base (applications that are standard in Apple IPAD Operating System configured for all NationalGrid users), and enhanced (applications that are specific for Gas and Electric Supervisors which requires a very minimal effort for Information Technology team in configuration on NationalGrid user IPAD) application as well as forms to the field supervisors, which will:

- Enable Field Supervisors to spend more time in the field providing better workforce interaction and oversight;
- Expand the availability of up to date information out to the field;
- Improve communications and decisions made while in the field; and
- Reduce paper while providing access to current Standards and Policies and digitizing paper forms



US Sanction Paper

3.3 Project Description

This project will enable the field supervisors to spend more time outside the office by providing many of the tools they need to do their job out in the field. This will be done by utilizing new capabilities including: Enterprise Mobility Management (EMM) and remote network access via Intelligent Hub (VPN).

The project will support the roll-out of 526 iPads for Gas Supervisors. This project will enable capabilities to the Gas and Electric field supervisors across Rhode Island, Massachusetts, and New York. Electric supervisors' IPAD's were rolled-out as part of INVP 4751 Electric Supervisor's Enablement Pilot.

Field supervisors will have the ability to enter and approve timesheet (FIORI); access GIS/mapping functionality (ArcGIS Collector, ArcGIS Explorer and LEMUR); access DigSafe New England region ticket management (DigTrack and DigTrack rapid shot); access safety incident management (IMS) and standard operating procedures (SOP); review unavailable time requests from field crews (Sedgwick VIA One); track mileage (MOTUS); attend meetings and conference calls via Webex; capture, store, and share documents via BOX and BOX Capture; and access the drive cam reports via DriveCam application.

The project will digitize gas (Field Damage Report) and electric forms (Design Approval Checklist, Overtime Approval Form, Time Off Request Form, Underground Splice Log, Confirming Work Request Overhead/Underground) using Salesforce, which reduces the data entry error, improve and automate storage, approval workflows and reporting of the results. The project will secure around 1100 salesforce user licenses to be utilized as part of this investment.

Training sessions will be conducted on the use of the iPads and capabilities, based on the familiarity of the groups with the technology.

3.4 Benefits Summary

Type	Benefit	Description
Intangible (Direct benefit)	Field Force Oversight	Supervisors will have less need to be in the office allowing them to spend more time in the field providing oversight of their crews.
Intangible (Direct benefit)	Risk reduction and compliance	New tools which allow access to current standards, policies and other information to assist the field operations in meeting regulatory requirements as well as enhance safety.
Intangible (Direct benefit)	Improved communications	Additional forms of communications will be enabled allowing supervisors and crews to better communicate including: taking pictures, web communications, and diagrams and sharing documents in real time.



US Sanction Paper

Intangible (Direct benefit)	Increased effectiveness	Access to system diagrams and maps in the field will allow for better discussion and resolutions of issues. The supervisor will have the ability to enter/approve time and expenses in the field while with their crews. The supervisor will have the ability to fill out and store forms in the field
Intangible (Indirect benefits)	Improved accuracy of reports	As information is captured directly in the field there is less need for re-entry of information which could lead to improved reporting.

3.5 Business and Customer Issues

There are no significant business issues beyond what has been described elsewhere.

3.6 Alternatives

Alternative 1: Do nothing - Rejected

This option was reviewed and rejected; by doing nothing the supervisors would still be spending much of their time in the office due to the need to access the tools and information currently only available within the internal network. In order to allow them to spend more time in the field, the tools needed must be available in the field.

Alternative 2: Delay Investment - Rejected

A review of the investment was done to determine if it would make sense to delay the investment; this option was rejected. The technologies utilized are currently being made available as part of a wider strategy for remote functionality. Currently, the resources are in place to partner with other functions to ensure a consistent and successful adoption of the capabilities. A delay of the investment would lead to much higher costs, more complex implementation and would not allow the supervisor to spend more time in the field.

Alternative 3: Select alternative solution - Rejected

As part of this investment other solutions were reviewed and rejected. The solution being brought forward is based on enterprise capabilities that are currently being put in place and have been selected as part of a wider strategy on mobility. The selection of alternative solutions would lead to higher costs, additional training requirements, and a more costly and complex support structure

Alternative 4: Minimum Cost Alternative – Rejected

As part of this investment, the team analyzed whether to build a separate Salesforce Environment as Salesforce is one of preferred field force applications for electricity and



US Sanction Paper

gas workforce. Gas Business Enablement is using Salesforce for field users and it would be beneficial for supervisors to use the same tool and environment instead of building a separate environment.

3.7 Safety, Environmental and Project Planning Issues

There are no significant issues beyond what has been described elsewhere

3.8 Execution Risk Appraisal

Risk Breakdown Structure Category	Qualitative Assessment / Risk Response Strategy				Risk Score	
	Risk ID + Title	IF Statement	THEN Statement	Risk Response Strategy		
5. Environmental	R3 - Individual application releases into the Single US Salesforce Org	the individual application releases into the Single US Salesforce Org is not pre-validated thoroughly prior to this implementation	There may be possible occurrences to overwrite salesforce code written from one project by another project	Reduce	US Salesforce Org Release management governance team will pre-validate individual changes in each release.	2
16. Estimating	R4 - Business requirement changes during the coarse of the project sprints	Business requirement changes during the coarse of the project sprints	it may hamper delivery schedules provided the change is accepted.	Reduce	Continue to engage Business within every Sprint cycle as per current plan.	6
1. Project Requirements	R2 - Migration for test cases, requirements from current tool to new tool	Migration for requirements, test cases to new tool has challenges.	More manula effort than current estimated will impact overall schedule of delivery	Reduce	Migrate test case and result information and fill up the identified gaps via manual effort.	3
1. Project Requirements	R5 - Offline requirements on IPADs with respect to forms	The limitations of technology with respect to business requirements for forms during offline usage.	Acceptance of technology limitations by business	Acceptance	Engage Business as early as possible on technology limitations during offline usage of forms by business	6
5. Environmental	R7 - Deployment risks to production Org	Discovery of unknown pre and post deployment steps in single US org	Schedules impacts are acceoptec as change is imperative	Acceptance	1. Project will capture pre and post deployment steps and share it promptly with core Release management team in order to give enough information as possible. 2. Identify common objects beforehand and collaborate with release Management teams periodically.	4

3.9 Permitting

N/A

3.10 Investment Recovery

3.10.1 Investment Recovery and Regulatory Implications

Recovery will occur at the time of the next rate case for any operating company receiving allocations of these costs.

3.10.2 Customer Impact

N/A

US Sanction Paper**3.10.3 CIAC / Reimbursement**

N/A

3.11 Financial Impact to National Grid**3.11.1 Cost Summary Table**

Project Number	Project Title	Project Estimate Level (%)	Spend (\$M)	Prior Yrs	Current Planning Horizon						Total
					Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
					2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	
INVP 4811	Supervisor Enablement iPad Roll-out	Est LM +/- 10%	CapEx	0.403	0.560	0.000	0.000	0.000	0.000	0.000	0.963
			OpEx	0.249	0.297	0.000	0.000	0.000	0.000	0.000	0.546
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.652	0.857	0.000	0.000	0.000	0.000	0.000	1.509

3.11.2 Project Budget Summary Table**Project Costs per Business Plan**

\$M	Prior Yrs (Actual)	Current Planning Horizon						
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	Total
		2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	Total
CapEx	0.403	0.458	0.000	0.000	0.000	0.000	0.000	0.861
OpEx	0.249	0.194	0.000	0.000	0.000	0.000	0.000	0.443
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.652	0.652	0.000	0.000	0.000	0.000	0.000	1.304

Variance (Business Plan-Project Estimate)

\$M	Prior Yrs (Actual)	Current Planning Horizon						
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	Total
		2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	Total
CapEx	0.000	(0.102)	0.000	0.000	0.000	0.000	0.000	(0.102)
OpEx	0.000	(0.103)	0.000	0.000	0.000	0.000	0.000	(0.103)
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	(0.205)	0.000	0.000	0.000	0.000	0.000	(0.205)

3.11.3 Cost Assumptions

- This investment will be managed by a National Grid Project Manager.
- Project will utilize internal National Grid Resources, external consultants and IBM technical resources
- Costs of license and services have been confirmed
- The accuracy level of estimate for each project is identified in table 3.11.1

US Sanction Paper**3.11.4 Net Present Value / Cost Benefit Analysis**

N/A

3.11.4.1 NPV Summary Table

N/A

3.11.4.2 NPV Assumptions and Calculations

N/A

3.11.5 Additional Impacts

N/A

3.12 Statements of Support**3.12.1 Supporters**

The supporters listed have aligned their part of the business to support the project.

Department	Individual	Responsibilities
Business Department	Gerard Lundquist	Business Representative
Business Partner (BP)	Premjith Singh	Relationship Manager
Business Partner (BP)	Robert Lorkiewicz	Relationship Manager
Program Delivery Management (PDM)	Michelle McNaught	Program Delivery Director
IT Finance	Michelle Harris	Manager
IT Regulatory	Daniel DeMauro	Director
Digital Risk and Security (DR&S)	Peter Shattuck	Manager
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Svetlana Lyba	Director

3.12.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Function	Individual
Regulatory	Harvey, Maria
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Currie, John
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego

US Sanction Paper**4 Appendices****4.1 Sanction Request Breakdown by Project**

N/A.

4.2 Project Cost Breakdown

Project Cost Breakdown \$ (millions)					
Cost Category	sub-category	Value of Work to Date (VOWD)	Forecast to Complete (FTC)	Forecast At Completion (FAC=VOWD+FTC)	Name of Firm(s) providing resources
Personnel	NG Resources	0.099	0.263	0.362	
	SDC Time & Materials		0.044	0.044	IBM
			0.068	0.068	WiPro
			-	-	DXC
			-	-	Verizon
	SDC Fixed-Price		-	-	IBM
			-	-	WiPro
			-	-	DXC
			-	-	Verizon
	All other personnel	0.376	0.355	0.731	
	TOTAL Personnel Costs	0.475	0.729	1.204	
Hardware	Purchase		-	-	
	Lease		-	-	
Software		0.000	0.065	0.065	
Risk Margin			0.040	0.040	
AFUDC		0.007	0.028	0.035	
Other		0.073	0.092	0.165	
TOTAL Costs		0.556	0.954	1.510	

4.3 NPV Summary

N/A

4.4 Customer Outreach Plan

N/A

4.5 Benefiting Operating Companies

Benefiting Operating Companies Table: This project will benefit all the companies listed below.

Operating Company Name	Business Area	State
------------------------	---------------	-------



US Sanction Paper

Niagara Mohawk Power Corp.- Electric Distr.	Electric Distribution	NY
Massachusetts Electric Company	Electric Distribution	MA
KeySpan Energy Delivery New York	Gas Distribution	NY
KeySpan Energy Delivery Long Island	Gas Distribution	NY
Boston Gas Company	Gas Distribution	MA
Narragansett Electric Company	Electric Distribution	RI
Niagara Mohawk Power Corp. - Transmission	Transmission	NY
Niagara Mohawk Power Corp. - Gas	Gas Distribution	NY
New England Power Company – Transmission	Transmission	MA, NH, RI, VT
Narragansett Gas Company	Gas Distribution	RI
Colonial Gas Company	Gas Distribution	MA
Narragansett Electric Company – Transmission	Transmission	RI
Nantucket Electric Company	Electric Distribution	MA
Massachusetts Electric Company – Transmission	Transmission	MA

4.6 IT Ongoing Operational Costs (RTB):

all figures in \$ thousands						
INV ID:	4811				Date RTB Last Forecasted	03/13/2019
Investment Name:	Supervisor Enablement iPad Rollout					
Project Manager:	Ashok Vallapu			PDM:	Michelle McNaught	
All figures in \$ thousands	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Total
	FY 19/20	FY 20/21	FY 21/22	FY 22/23	FY 23/24	
Last Sanctioned Net Impact to RTB						
Last Sanction IS Net Impact to RTB	279.0	279.0	279.0	279.0	279.0	1,395.0
Last Sanction Business Net Impact to RTB						
Last Sanction Total Net Impact to RTB	279.0	279.0	279.0	279.0	279.0	1,395.0
Planned/Budgeted Net Impact to RTB						
IS Investment Plan Net Impact to RTB	279.0	279.0	279.0	279.0	279.0	1,395.0
Business Budgeted Net Impact to RTB						
Currently Forecasted Net Impact to RTB						
IS Funded Net Impact to RTB Forecasted at Go-Live	50.0	80.0	80.0	80.0	80.0	370.0
Business Funded Net Impact to RTB Forecasted at Go-Live	-	-	-	-	-	
Variance to Planned/Budgeted Net Impact to RTB						
IS Investment Plan Net Impact to RTB Variance	229.0	199.0	199.0	199.0	199.0	1,025.0
Business Budgeted Net Impact to RTB Variance	-	-	-	-	-	

4.7 Other Appendices

N/A



US Sanction Paper

Title:	NY Tax Remittance and Reporting Corrections	Sanction Paper #:	USSC-18-222 v2
Project #:	INVP 4821 Capex: S007872	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	12/18/2018
Author:	Susan Stallard Teders / Mike Pawlowski	Sponsor:	Jody Allison, VP Billing and Collections Strategy
Utility Service:	IT	Project Manager:	Mike Pawlowski / Saurabh Verrma

1 Executive Summary

1.1 **Sanctioning Summary**

This paper requests sanction of INVP 4821 in the amount of \$2.049M with a tolerance of +/- 10% for the purposes of Full Implementation.

This sanction amount is \$2.049M broken down into:

\$1.818M Capex

\$0.231M Opex

\$0.000M Removal

1.2 **Project Summary**

This project is to address the proper presentation of the municipal Gross Receipts Tax (GRT) tax and the Sales tax on selected non-service business-product transactions. In addition, multi-year retroactive adjustments are required for current and historical tax reporting. Specifically, National Grid's billing system requires updates and modifications to the existing tax structure calculations and reporting mechanisms.

1.3 **Summary of Projects**

Project Number	Project Title	Estimate Amount (\$M)
INVP 4821 CAPEX: S007872	NY Tax Remittance and Reporting Corrections	2.049
Total		2.049

1.4 **Associated Projects**

N/A

US Sanction Paper**1.5 Prior Sanctioning History**

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Sanction Type	Potential Investment Tolerance
5/28/18	USSC	\$0.632M	\$2.083M	Partial Sanction	+/- 25%

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
February 2020	Project Closure Sanction

1.7 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input checked="" type="radio"/> Mandatory <input type="radio"/> Policy- Driven <input type="radio"/> Justified NPV <input type="radio"/> Other	Compliance with New York State Taxation Laws

1.8 Asset Management Risk ScoreAsset Management Risk Score: 49**Primary Risk Score Driver:** (Policy Driven Projects Only)
☐ Reliability
 ☐ Environment
 ☐ Health & Safety
 ☒ Not Policy Driven



US Sanction Paper

1.9 Complexity Level

☒ High Complexity ☐ Medium Complexity ☐ Low Complexity ☐ N/A

Complexity Score: 25

1.10 Process Hazard Assessment

A Process Hazard Assessment (PHA) is required for this project:

☐ Yes ☒ No

1.11 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan
IT Investment Plan FY19 - 23	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA	\$0.165M

1.12 If cost > approved Business Plan how will this be funded?

Re-allocation of budget within the IT business has been managed to meet jurisdictional budgetary, statutory and regulatory requirements.

1.13 Current Planning Horizon

		Current Planning Horizon						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
\$M	Prior Yrs	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	
CapEx	0.000	0.708	1.110	0.000	0.000	0.000	0.000	1.818
OpEx	0.000	0.206	0.025	0.000	0.000	0.000	0.000	0.231
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.000	0.914	1.135	0.000	0.000	0.000	0.000	2.049



US Sanction Paper

1.14 Key Milestones

Milestone	Target Date: (Month Year)
Start Up	April 2018
Partial Sanction	May 2018
Begin Requirements and Design	May 2018
Project Sanction	January 2019
Begin Development and Implementation	January 2019
Begin User Acceptance Testing	September 2019
Move to Production / Last Go Live	November 2019
Project Closure	February 2020

1.15 Resources, Operations and Procurement

Resource Sourcing			
Engineering & Design Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Construction/Implementation Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Resource Delivery			
Availability of internal resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Availability of external resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Operational Impact			
Outage impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Procurement Impact			
Procurement impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green

1.16 Key Issues (include mitigation of Red or Amber Resources)

N/A

**US Sanction Paper****1.17 Climate Change**

Contribution to National Grid's 2050 80% emissions reduction target:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative
Impact on adaptability of network for future climate change:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative

1.18 List References

N/A



US Sanction Paper

2 Decisions

I:

(a) APPROVE this paper and the investment of \$2.049M and a tolerance of +/-10% for the purposes of Development and Implementation.

(b) NOTE that Mike Pawlowski is the Project Manager and has the approved financial delegation.

Signature.....Date.....

David H. Campbell, Vice President ServCo Business Partnering, USSC Chair

US Sanction Paper**3 Sanction Paper Detail**

Title:	NY Tax Reporting and Remittance Corrections	Sanction Paper #:	USSC-18-222 v2
Project #:	INVP 4821 Capex: S007872	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	12/18/2018
Author:	Susan Stallard Teders / Mike Pawlowski	Sponsor:	Jody Allison, VP Billing and Collections Strategy
Utility Service:	IT	Project Manager:	Mike Pawlowski / Saurabh Verrma

3.1 *Background*

During the course of a KEDLI customer bill inquiry in November 2016 it was determined the late payment charge (LPC) did not have Municipal Gross Receipts Tax, (MUNI GRT) applied. The National Grid Tax Department confirmed that MUNI GRT needs to be applied. This led to an assessment of how CSS was handling taxes with respect to Non-Service Revenue. The discussions and research, that followed led to the identification of the following required adjustments related to:

- Tax for selected business-product combinations
- Tax for non-service business-product combinations
- Reporting non-service taxes
- Capture/identification of all taxes collected by tax district
- Presentation of non-service taxes on the customer bill

Tax reporting on service sales had a well-defined set of reporting. These changes will improve consistency in reporting of non-service sales.

3.2 *Drivers*

The primary driver for this project is compliance with various New York State tax laws.

3.3 *Project Description*

Modifications to National Grid's Billing System's static table/code are necessary to implement the calculation of sales tax and/or MUNI GRT on those business-product combinations identified by Tax Department.

Specifically, for Niagara Mohawk, there are 9 business-product combinations that need corrective action for sales tax. There are 43 business-product combinations that need corrective action for MUNI GRT.



US Sanction Paper

For KEDLI, there are 3 business-product combinations that need corrective sales tax action and 17 business-product combinations that need corrective MUNI GRT action.

Modifications from service only revenue reports will be made to create improved for non-Service Revenue.

3.4 Benefits Summary

Compliance with New York State Tax laws and reporting obligations and the avoidance of any penalties and interest for the underreporting of tax liabilities.

3.5 Business and Customer Issues

There are no additional business or customer issues beyond what has been described elsewhere in this paper.

3.6 Alternatives

Alternative 1: Do Nothing: Defer Project

This alternative was not selected as National Grid is required to be in compliance with New York State tax laws.

Alternative 2: Manual Calculation

Tax Liability will be manually calculated and reported until such time as this project can be delivered to perform these tasks in a more cost effective manner. This option is not viable for an ongoing solution as manual processing introduces human error factors and can require additional time to correct.

3.7 Safety, Environmental and Project Planning Issues

There are no significant safety, environmental or project planning issues beyond what has been described elsewhere in this paper.

US Sanction Paper**3.8 Execution Risk Appraisal**

Number	Detailed Description of Risk / Opportunity	Probability	Impact		Score		Strategy	Pre-Trigger Mitigation Plan	Residual Risk	Post Trigger Mitigation Plan
			Cost	Schedule	Cost	Schedule				
1	Competition for CSS resources due to multiple projects may cause a delay in development	3	1	1	3	3	Avoid	Use normal forecasting tools to reserve resources	High Priority and unforeseen resource demands could still potentially arise	Work with IT Solution Delivery management to prioritize project work and defer work as necessary
2	Code availability for change may be impacted by parallel projects	2	1	1	2	2	Mitigate	Meet with all relevant project managers to compare schedules and technical plans to identify potential overlaps	Unforeseen conflicts occur due to new project work or missed impacts	Work with IT Solution Delivery management to prioritize project work and defer work as necessary
3	Testing may be impacted by corporate financial schedules and business teams availability	3	2	2	6	6	Avoid	Develop project development and testing schedule after discussion with business about potential impacts	Unforeseen conflicts occur due to new work or changing business priorities	Work with IT Solution Delivery management and business management to prioritize project work and defer work as necessary

3.9 Permitting

N/A

3.10 Investment Recovery**3.10.1 Investment Recovery and Regulatory Implications**

Recovery will occur at the time of the next rate case for any operating company receiving allocations of these costs.

3.10.2 Customer Impact

N/A

3.10.3 CIAC / Reimbursement

N/A



US Sanction Paper

3.11 Financial Impact to National Grid

3.11.1 Cost Summary Table

					Current Planning Horizon						
Project Number	Project Title	Project Estimate Level (%)	Spend (\$M)	Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	Total
					2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	
INVP 4821 CAPEX: S007872	NY Tax Remittance and Reporting Corrections	+/- 10%	CapEx	0.000	0.708	1.110	0.000	0.000	0.000	0.000	1.818
			OpEx	0.000	0.206	0.025	0.000	0.000	0.000	0.231	
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
			Total	0.000	0.914	1.135	0.000	0.000	0.000	2.049	
Total Project Sanction			CapEx	0.000	0.708	1.110	0.000	0.000	0.000	0.000	1.818
			OpEx	0.000	0.206	0.025	0.000	0.000	0.000	0.000	0.231
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
			Total	0.000	0.914	1.135	0.000	0.000	0.000	2.049	

3.11.2 Project Budget Summary Table

Project Costs per Business Plan

\$M	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
		2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	
CapEx	0.000	0.708	0.930	0.000	0.000	0.000	0.000	1.638
OpEx	0.000	0.206	0.040	0.000	0.000	0.000	0.000	0.246
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.914	0.970	0.000	0.000	0.000	0.000	1.884

Variance (Business Plan-Project Estimate)

\$M	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
		2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	
CapEx	0.000	(0.000)	(0.180)	0.000	0.000	0.000	0.000	(0.180)
OpEx	0.000	0.000	0.015	0.000	0.000	0.000	0.000	0.015
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	(0.000)	(0.165)	0.000	0.000	0.000	0.000	(0.165)

3.11.3 Cost Assumptions

The accuracy level of estimate for each project is identified in table 3.11.1.

3.11.4 Net Present Value / Cost Benefit Analysis

3.11.4.1 NPV Summary Table

N/A



US Sanction Paper

3.11.4.2 NPV Assumptions and Calculations

N/A

3.11.5 Additional Impacts

N/A

3.12 Statements of Support

3.12.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Department	Individual	Responsibilities
Business Department	Jody Allison	Business Representative
IT Global Solutions Development	Michelle McNaught	IT Global Solutions
IT Business Partner (BP)	Joel Semel	Relationship Manager
IT Global Solutions Development	Mike Pawlowski	Program Delivery Director
IT Finance	Michelle Harris	Manager
IT Regulatory	Dan DeMauro	Director
Digital Risk and Security (DR&S)	Peter Shattuck	Manager
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director

3.12.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Function	Individual
Regulatory	Maria Harvey
Jurisdictional Delegate - Electric NY	Mark Harbaugh
Jurisdictional Delegate - FERC	Terron Hill
Jurisdictional Delegate - Gas NY	Don Wolf
Procurement	Diego Chevere



US Sanction Paper

4 Appendices

4.1 Sanction Request Breakdown by Project

N/A

4.2 Other Appendices

4.2.1 Project Cost Breakdown

Project Cost Breakdown \$ (millions)					
Cost Category	sub-category	Value of Work to Date (VOWD)	Forecast to Complete (FTC)	Forecast At Completion (FAC=VOWD+FTC)	Name of Firm(s) providing resources
Personnel	NG Resources		0.260	0.260	
	SDC Time & Materials		1.129	1.129	IBM
			0.025	0.025	WiPro
			-	-	DXC
			-	-	Verizon
	SDC Fixed-Price		-	-	IBM
			-	-	WiPro
			-	-	DXC
			-	-	Verizon
	All other personnel	0.437	-	0.437	
	TOTAL Personnel Costs	0.437	1.413	1.850	
Hardware	Purchase		-	-	
	Lease		-	-	
Software			-	-	
Risk Margin			0.077	0.077	
AFUDC			0.087	0.087	
Other			0.035	0.035	
TOTAL Costs		0.437	1.612	2.049	

4.2.2 Benefiting Operating Companies

Operating Company Name	Business Area	State
Niagara Mohawk Power Corp - Electric	Electric Distribution	NY
Niagara Mohawk Power Corp – Gas	Gas Distribution	NY
KeySpan Energy Delivery Long Island	Gas Distribution	NY



US Sanction Paper

4.2.3 IS Ongoing Operational Costs (RTB):

This project will change the IT ongoing operations support costs as per the following table. These are also known as Run the Business (RTB) costs.

all figures in \$ thousands						
INV ID:	4821				Date RTB Last Forecasted	12/07/2018
Investment Name:						
Project Manager:				PDM:		
All figures in \$ thousands	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Total
	FY 19/20	FY 20/21	FY 21/22	FY 22/23	FY 23/24	
Last Sanctioned Net Impact to RTB						
Last Sanction IS Net Impact to RTB						-
Last Sanction Business Net Impact to RTB						-
Last Sanction Total Net Impact to RTB	-	-	-	-	-	-
Planned/Budgeted Net Impact to RTB						
IS Investment Plan Net Impact to RTB						-
Business Budgeted Net Impact to RTB						-
Currently Forecasted Net Impact to RTB						
IS Funded Net Impact to RTB Forecasted at Go-Live	-	-	-	-	-	-
Business Funded Net Impact to RTB Forecasted at Go-Live	-	-	-	-	-	-
Variance to Planned/Budgeted Net Impact to RTB						
IS Investment Plan Net Impact to RTB Variance	-	-	-	-	-	-
Business Budgeted Net Impact to RTB Variance	-	-	-	-	-	-

4.3 NPV Summary

N/A

4.4 Customer Outreach Plan

N/A



Closure: US Sanction Paper

Title:	Hicksville Fiber Upgrades	Sanction Paper #:	USSC-18-165 C
Project #:	INVP 4828	Sanction Type:	Closure
Capex #:	5007834		
Operating Company:	National Grid USA Svc. Co.	Date of Request:	7/16/2019
Author:	Bucceri, Michael Yee, Andrew	Sponsor(s):	Olive, Stephen Chief Information Officer
Utility Service:	IT	Project Manager:	Costello, Andrew

Executive Summary

This paper is presented to close INVP 4828. The total spend was \$0.681M. The original sanctioned amount for this project was \$1.260M at +/- 10%.

Project Summary

The Hicksville campus fiber cable plant is approximately 30 years old and was not routed efficiently. There were several failed fiber stands that put the integrity of the campus communications at risk. The campus used a multi-mode fiber cable specification which was no longer the industry standard and unable to support today's high speed networking requirements.

This project was scheduled to replace the aged multi-mode fiber optic plant that supported the Hicksville campus with an optimally routed single mode fiber optic cable plant.

This project was de-scoped to have fiber runs completed across the Network closets but the migrations did not occur. There was also a decision to not further enhance Hicksville campus due to National Grid moving from this location.

Equipment that was ordered and not used was inventoried and placed in Hicksville print pool.

Schedule Variance Table

Schedule Variance	
Project Grade - Ready to use Date	3/31/2019
Actual Ready to use Date	10/9/2018
Schedule Variance	0 year(s), 5 month(s), 23 day(s)

Schedule Variance Explanation

Due to the project cancellation, full implementation was not achieved.

Cost Summary Table

Project Sanction Summary (\$M)

Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Capex	0.279	1.057	0.778
Opex	0.402	0.203	(0.199)
Removal	0.000	0.000	0.000
Total	0.681	1.260	0.579

Cost Variance Analysis

Portfolio reprioritization across IS resulted in de-scoping of this project.

Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)

Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Hicksville Fiber Upgrades	Capex	0.279	1.057	0.778
	Opex	0.402	0.203	(0.199)
	Removal	0.000	0.000	0.000
	Total	0.681	1.260	0.579

Project Sanction Summary (\$M)

Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Total	0.279	1.057	0.778
	0.402	0.203	(0.199)
	0.000	0.000	0.000
Total	0.681	1.260	0.579

Improvements / Lessons Learned

- Alignment of ECO partners to perform R&D before implementing will allow them to allocate time for this process in their proposals.
- Maintaining historical records of prior project activity will allow others to leverage the information and reduce planning costs.

Closeout Activities

ACTIVITY	COMPLETED
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused material have been returned	<input type="radio"/> Yes <input checked="" type="radio"/> No
All as-builts have been completed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All lessons learned have been entered appropriately into the lesson learned database	<input checked="" type="radio"/> Yes <input type="radio"/> No

Statement of Support		
Department	Individual	Responsibilities
Business Department	Page, Douglas B.	Business Representative
Business Partner (BP)	Davidson, Caitlin	Relationship Manager
Program Delivery Management (PDM)	Campbell, Douglas	Program Delivery Director
IT Finance	Harris, Michelle	Manager
IT Regulatory	DeMauro, Daniel J.	Director
Digital Risk and Security (DR&S)	Wilson, Elaine	Director
Service Delivery	Mirizio, Mark	Manager
Enterprise Architecture	Clinchot, Joseph J.	Director
Enterprise Portfolio Management	Cronin, Daniel	Analyst
Reviewers		
Function	Individual	
Regulatory	Mancinelli, Lauri A.	
Jurisdictional Delegate - Electric NE	Easterly, Patricia	
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.	
Jurisdictional Delegate - FERC	Hill, Terron	
Jurisdictional Delegate - Gas NE	Smith, Amy	
Jurisdictional Delegate - Gas NY	Wolf, Don	
Procurement	Chevere, Diego	

Decisions

I approve this paper.

Signature DLH. Campbell
Date 7/26/19

David H. Campbell, Vice President US Treasury, USSC Chair

Appendix

N/A



Closure Paper

Title:	Customer Data Visualization	Sanction Paper #:	
Project #:	INVP 4891	Sanction Type:	Closure
Operating Company:	National Grid USA Svc. Co.	Date of Request:	11/2/2018
Author:	Brendan Mahoney / Thomas Towne	Sponsor:	Terry Sobolewski
Utility Service:	IT	Project Manager:	Brendan Mahoney / Thomas Towne

1 Executive Summary

This paper is presented to close INVP 4891. The total spend was \$0.722M. The original sanctioned amount for this project was \$0.768M at +/- 10%.

The final spend amount is \$0.722M broken down into:

\$0.700M Capex

\$0.022M Opex

\$0 Removal

2 Project Summary

Building upon the success of the Data (CC&I) business areas, allowing the business to achieve their reporting, data retention and regulatory obligations. Key dashboard deliverables from the project included Visualization core implementation in Tableau last year, the Customer Data Visualization project expanded National Grid's Data and Analytics capabilities. The project built or expanded 11 dashboards for the Customer Response Center (CRC) and Customer Communications and Insights CRC Summary, Brand Health FY2017, Brand Health FY2018, Outage, Weather, Contact Center, DG Trend, Rate Change Timeline, Communication Reach, CRC Performance, and a Contact Center Toolkit. The dashboards have been successfully deployed, creating value to the business with improved reporting capabilities, more access to key information across CRC and CC&I, and clear visualization of customer data that can improve analytics related to customer experience, customer care, and customer marketing.



Closure Paper

3 Variance Analysis

3.1 Cost Summary Table

Project Sanction Summary (\$M)				
INVP 4891	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Customer Data Visualization	Capex	0.700	0.724	0.024
	Opex	0.022	0.044	0.022
	Removal	0.000	0.000	0.000
	Total	0.722	0.768	0.046

3.2 Cost Variance Analysis

For Capex spending, there was no major variance between the original sanctioned amount of \$0.724M and the actual expenditure of \$0.700M. The final difference of \$0.024M can mostly be attributed to the \$0.012M in unused Capex Risk costs. There were other minor variations in National Grid labor expenses, but overall the final Capex expenditures amounted to 97% of the total sanctioned amount.

For Opex spending, there was greater variance between the original sanctioned amount of \$0.044M and the actual expenditure of \$0.022M. Much of this can be attributed to the \$0.008 of unused Opex Risk costs. Other than the risk costs, Opex labor expenses totaled less than the original sanctioned amount. Overall, the final Capex expenditures amounted to 49% of the original sanctioned amount.

3.3 Schedule Variance Table

Schedule Variance	
Project Grade – Ready for Use Date	03/31/2018
Actual Ready for Use Date	03/31/2018
Schedule Variance	0 years, 0 months, 0 days



Closure Paper

3.4 Schedule Variance Explanation

4 Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)				
Customer Data Visualization	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
INVP 4891	Capex	0.700	0.724	0.024
	Opex	0.022	0.044	0.022
	Removal	0.000	0.000	0.000
	Total	0.722	0.768	0.046

5 Improvements / Lessons Learned/Root Cause

- IT Knowledge Management Tool (KMT) lesson learned database links:
 - [2018-LL-612](#)
 - [2018-LL-613](#)
 - [2018-LL-614](#)



Lessons Learnt Log -
4891 CDV.xls

Please reference the [Lessons Learnt Log](#) on Sharepoint. Some of the lessons learnt are related to process—namely, the process of applying National Grid's Solution Delivery Framework (SDF) to a project pursuing an Agile approach. The Agile nature of this project required more flexibility in completing documentation. For example, an overall enabling requirements document was coupled with functional requirements documents and design documents for each of the dashboards, in lieu of an overarching Business Requirements Document. In essence, some aspects of the SDF will have to change when completing an Agile project, but required elements must be met by alternative means if necessary, and proper approvals of those alternative means must be made by all the necessary stakeholders.



Closure Paper

6 Closeout Activities

The following closeout activities have been completed.

Activity	Completed
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused materials have been returned	<input checked="" type="radio"/> Yes <input type="radio"/> No
All IT Service Transition activities have been completed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All lessons learned have been entered appropriately into the IT Knowledge Management Tool (KMT) lesson learned database	<input checked="" type="radio"/> Yes <input type="radio"/> No



Closure Paper

7 Statements of Support

7.1 **Supporters**

The supporters listed have aligned their part of the business to support the project.

Department	Individual	Responsibilities
Business Department	Gregory Bergelson	Business Representative
Program Delivery ManagementPDM	Narayan Devireddy	Vice President IT, Solution Delivery
Business Partner (BP)	Joel Semel	Relationship Manager
Program Delivery Management (PDM)	Jeff Dailey	Program Delivery Director
IT Finance	Michelle Harris	Manager
IT Regulatory	Dan DeMauro	Director
Digital Risk and Security (DR&S)	Peter Shattuck	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director

7.2 **Reviewers**

N/A



Closure Paper

8 Decisions

The US ISSC Sanctioning Committee and Executive Sponsor has reviewed and approved this paper.

Signature.....Date.....

Premjith Singh

VP IT Tower Lead, Operations and Network



US Sanction Paper

Title:	MA DOR - CRIS	Sanction Paper #:	USSC-19-205
Project #:	INVP 4910 Capex: S008003	Sanction Type:	Partial Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	4/2/2019
Author:	Susan Stallard Teders	Sponsor:	Jody Allison, VP Billing and Collections Strategy
Utility Service:	IT	Project Manager:	Richard Balsano / Riziel Cruz-Bower

1 Executive Summary

1.1 Sanctioning Summary

This paper requests partial sanction of INVP 4910 in the amount of \$1.055M with a tolerance of +/- 10% for the purposes of development and implementation for Workstream 1 – Batch Automation of the Tax Agreement (review and update processes); Workstream 2 – Massachusetts Department of Revenue (MA -DOR) Online Validation Automation; and Workstream 3 – Annual Billing Report.

This sanction amount is \$1.055M broken down into:

\$0.939M Capex

\$0.115M Opex

\$0.000M Removal

NOTE the potential investment of \$1.377M with a tolerance of +/- 25%, contingent upon submittal and approval of a Project Sanction paper following completion of Workstream 1, and development for Workstream 2 and Workstream 3. The final sanction for this project will be for testing and implementation of Workstream 2 and Workstream 3.

1.2 Project Summary

This mandated project for the MA -DOR will change the way tax exemptions are managed for small businesses. Starting in January 2019, Massachusetts taxpayers must use a web site to apply for tax exemptions. The MA -DOR will approve the exemption and provide the taxpayer with a Tax Exemption Number. The taxpayer is responsible for providing the tax exemption number to their utility provider (electric, gas, and/or Energy Service Company (ESCO)). National Grid is required to validate the number, and retain and provide the number during audits by the MA -DOR.

This project has been divided into three workstreams: (1) Batch Automation of the Tax Agreement; (2) Online Automation for the MA DOR Validation Process; (3) Annual Billing Report, which address the changes required to the Customer Related Information System (CRIS) and is utilized to bill MA Gas customers. A separate project and



US Sanction Paper

sanction paper (INVP 4910A MA DOR – CSS) will address changes to the Customer Service System (CSS).

1.3 Summary of Projects

Project Number	Project Title	Estimate Amount (\$M)
INVP 4910 CAPEX:199546	MA DOR - CRIS	1.377
Total		1.377

1.4 Associated Projects

Project Number	Project Title	Estimate Amount (\$M)
INVP 4910A CAPEX: 199548	MA DOR CSS	0.948
Total		0.948

1.5 Prior Sanctioning History

N/A

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
August 2019	Project Sanction

1.7 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input checked="" type="radio"/> Mandatory <input type="radio"/> Policy- Driven <input type="radio"/> Justified NPV <input type="radio"/> Other	Massachusetts Department of Revenue (MA -DOR) is mandating that utility customers use the web site MATaxConnect.com to apply for a tax exemption number.



US Sanction Paper

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1.8 Asset Management Risk Score

Asset Management Risk Score: 49

Primary Risk Score Driver: (Policy Driven Projects Only)

- ☐ Reliability
☐ Environment
☐ Health & Safety
☒ Not Policy Driven

1.9 Complexity Level

- ☐ High Complexity
☒ Medium Complexity
☐ Low Complexity
☐ N/A

Complexity Score: 22

1.10 Process Hazard Assessment

A Process Hazard Assessment (PHA) is required for this project:

- ☐ Yes
☒ No

1.11 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved



US Sanction Paper

			Business Plan (\$)
IT Investment Plan FY20 - 24	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA	\$0.104M

1.12 If cost > approved Business Plan how will this be funded?

Re-allocation of budget within the IT business has been managed to meet jurisdictional budgetary, statutory and regulatory requirements.

1.13 Current Planning Horizon

\$M	Prior Yrs	Current Planning Horizon						
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	Total
		2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	
CapEx	0.304	0.894	0.000	0.000	0.000	0.000	0.000	1.198
OpEx	0.116	0.064	0.000	0.000	0.000	0.000	0.000	0.179
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.420	0.958	0.000	0.000	0.000	0.000	0.000	1.377

1.14 Key Milestones

Milestone	Target Date: (Month Year)
Start Up	September 2018
Partial Sanction	January 2019
Begin Requirements and Design	October 2018
Partial Sanction	April 2019
Begin Development – workstreams 1, 2, 3	April 2019
Begin User Acceptance Testing – workstream 1	July 2019
Project Sanction	August 2019
Begin User Acceptance Testing – workstream 2, 3	September 2019
Move to Production / Last Go Live	October 2019
Project Closure	January 2020

1.15 Resources, Operations and Procurement

US Sanction Paper

Resource Sourcing			
Engineering & Design Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Construction/Implementation Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Resource Delivery			
Availability of internal resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Availability of external resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Operational Impact			
Outage impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Procurement Impact			
Procurement impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green

1.16 Key Issues (include mitigation of Red or Amber Resources)

N/A

1.17 Climate Change

Contribution to National Grid's 2050 80% emissions reduction target:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative
Impact on adaptability of network for future climate change:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative

1.18 List References

N/A



US Sanction Paper

2 Decisions

I:

- (a) APPROVE this paper and the investment of \$1.055M and a tolerance of +/-10% for the purposes of development and implementation for Workstream 1 – Batch Automation of the Tax Agreement; updates and development for Workstream 2 – MA DOR Online Validation Automation; and Workstream 3 – Annual Billing Report.
- (b) NOTE the potential run-the-business (RTB) impact of \$0.006M for FY20 and \$0.014M (per annum) for 4 years.
- (c) NOTE the potential investment \$1.376M and a tolerance of +/- 25%, contingent upon submittal and approval of a Project Sanction paper following completion of partial development and implementation of Workstream 1 – Batch Automation of the Tax Agreement; and updates and development 2 – MA DOR Online Validation Automation and Workstream 3 – Annual Billing Report.
- (d) NOTE that Riziel Cruz-Bower is the Project Manager and has the approved financial delegation to undertake the activities stated in (a).

Signature.....Date.....

David H. Campbell, Vice President ServCo Business Partnering, USSC Chair

US Sanction Paper**3 Sanction Paper Detail**

Title:	MA DOR - CRIS	Sanction Paper #:	USSC-19-205
Project #:	INVP 4910 Capex: S008003	Sanction Type:	Partial Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	4/2/2019
Author:	Susan Stallard Teders	Sponsor:	Jody Allison, VP Billing and Collections Strategy
Utility Service:	IT	Project Manager:	Richard Balsano / Riziel Cruz-Bower

3.1 *Background*

Prior to January 2019, MA small business owners were responsible to provide a signed paper certificate for tax exemption. National Grid stored this certificate in the Avalara TEM system, as they were required to produce these certificates during audits conducted by the MA DOR. Starting in January 2019, MA taxpayers will use a web-site (MATaxConnect.com) to apply for a tax exemption. After MA -DOR approves the exemption, it will provide a Tax Exemption number# (Ex#) to the taxpayer who will then contact his or her electric utility, gas utility and/or ESCO to provide that number.

3.2 *Drivers*

The MA -DOR is requiring that MA small businesses use a web site (MATaxConnect.com) to request tax exemption number for tax exemption status.

3.3 *Project Description*

This Project is comprised of three workstreams:

- Workstream 1 – Batch Automation of the Tax Agreement review and update process.
- This includes the web service call to MA DOR to verify the exemption number, status, effective date and expiration date.
- Workstream 2 – MA DOR Online Validation Automation
- Workstream 3 – Annual Billing Report

To meet the mandate, National Grid will roll out the following solution for the CRIS application:

- Processes that will:



US Sanction Paper

- Provide the ability for Customer Service Reps to be able to capture pending Tax Exemption number
- Validate the customer provided tax exemption number against the MA DOR web site
- Verify the tax exemption is still valid
- Automate the CRIS application to:
 - Update CRIS with the validated tax exemption number
 - Update CRIS with the effective and expiration dates from MA DOR
 - Update the customer tax exemption status
- Create Error Reports that identify unverified tax exemption numbers
- Create Exception Reports that:
 - Identify accounts that need to be manually rebilled due to the tax exemption dates and/or status changing, for bills already produced
 - Identify Accounts that the tax exemption expiration date has changed
 - Provide the ability to retain tax exemption numbers provided by the customer that cannot be validated
- Retain history of tax exemption status changes for auditing
- Perform end to end testing before go-live
- Deploy the solution into production
- Provide post production implementation support.

This solution to implement an automated process to meet the MA DOR mandate is the Minimum Alternative cost option.

3.4 Benefits Summary

N/A

3.5 Business and Customer Issues

There are no significant business issues beyond what has been described elsewhere in this paper.

3.6 Alternatives

Alternative 1: Business Area to process tax exemption status manually.

This option would require the Business to manually processes the tax exemption status of the MA utility customers. Without automation of the CRIS application, the Business is projecting it would need to hire and additional 18 full time employees.

Rejected: This alternative was rejected as the business would need to increase the staff to handle the manual process.

Indicative Cost: \$1.920M per annum

US Sanction Paper**Alternative 2: Do Nothing / Delay Investment**

Leaving the CRIS application as is is not viable as the MA DOR has changed the way it will process tax exempt statuses for its utility customers. If National Grid does nothing or delays investment, it will be out of compliance and at risk of incorrectly billing the Company's customers.

Rejected: National Grid must implement these required updates to remain in compliance with a state directed mandate from the MA -DOR.

Indicative Cost: \$0.000M

3.7 Safety, Environmental and Project Planning Issues

There are no significant issues beyond what has been described elsewhere.

3.8 Execution Risk Appraisal

Risk Breakdown Structure Category	Qualitative Assessment / Risk Response Strategy					Risk Score
	Risk ID + Title	IF Statement	THEN Statement	Risk Response Strategy		
15. Vendor	R5 - Availability of internal resource vendor resources	If Verizon resources are not available to deliver due to a very aggressive timeline.	The project may be delayed until resources are available.	Share	Engage with Verizon early in start-up phase.	12
17. Resources	R6 - Availability of Business resources to perform simultaneous CRIS and CSS testing.	If CRIS and CSS MA DOR UAT testing were to run simultaneously	There may not be enough Business resources to handle the UAT testing for both CRIS and CSS.	Reduce	Stagger the testing schedules and or add resources to handle the UAT testing.	12
1. Project Requirements	R7 - Manual process until process automation	If there are dramatic increases in customer volume prior to process automation is delivered.	The business may be inundated with exemption requests between the end of when 3 month extension expires and workstream 1 is delivered.	Accept	The business will add additional resources to handle the additional work.	4

3.9 Permitting

N/A

3.10 Investment Recovery**3.10.1 Investment Recovery and Regulatory Implications**

Recovery will occur at the time of the next rate case for any operating company receiving allocations of these costs.

3.10.2 Customer Impact

N/A



US Sanction Paper

3.10.3 CIAC / Reimbursement

N/A

3.11 Financial Impact to National Grid

3.11.1 Cost Summary Table

Project Number	Project Title	Project Estimate Level (%)	Spend (\$M)	Prior Yrs	Current Planning Horizon						Total
					Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
INVP 4910 CAPEX:199546	MA DOR - CRIS	+/- 10%	CapEx	0.304	0.894	0.000	0.000	0.000	0.000	0.000	1.198
			OpEx	0.116	0.064	0.000	0.000	0.000	0.000	0.000	0.179
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.420	0.958	0.000	0.000	0.000	0.000	0.000	1.377

3.11.2 Project Budget Summary Table

Project Costs per Business Plan

\$M	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
		2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	
CapEx	0.304	0.811	0.000	0.000	0.000	0.000	0.000	1.115
OpEx	0.116	0.043	0.000	0.000	0.000	0.000	0.000	0.159
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.420	0.854	0.000	0.000	0.000	0.000	0.000	1.274

Variance (Business Plan-Project Estimate)

\$M	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
		2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	
CapEx	0.000	(0.083)	0.000	0.000	0.000	0.000	0.000	(0.083)
OpEx	0.000	(0.021)	0.000	0.000	0.000	0.000	0.000	(0.021)
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	(0.104)	0.000	0.000	0.000	0.000	0.000	(0.104)

3.11.3 Cost Assumptions

N/A

US Sanction Paper**3.11.4 Net Present Value / Cost Benefit Analysis**

This not an NPV project.

3.11.4.1 NPV Summary Table

N/A

3.11.4.2 NPV Assumptions and Calculations

N/A

3.11.5 Additional Impacts

N/A

3.12 Statements of Support**3.12.1 Supporters**

The supporters listed have aligned their part of the business to support the project.

Department	Individual	Responsibilities
Revenue Cycle Management	Jody Allison	VP
Business Partner (BP)	Joel Semel	Director
IT Global Solutions Development	Riziel Cruz-Brower	Director
IT Finance	Michelle Harris	Manager
IT Regulatory	Dan DeMauro	Director
Digital Risk and Security (DR&S)	Peter Shattuck	Manager
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director

3.12.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Function	Individual
Regulatory	Harvey, Maria
Jurisdictional Delegate - Gas NE	Currie, John
Procurement	Chevere, Diego

US Sanction Paper**4 Appendices****4.1 Sanction Request Breakdown by Project**

N/A

4.2 Project Cost Breakdown

Project Cost Breakdown \$ (millions)					
Cost Category	sub-category	Value of Work to Date (VOWD)	Forecast to Complete (FTC)	Forecast At Completion (FAC=VOWD+FTC)	Name of Firm(s) providing resources
Personnel	NG Resources		0.040	0.040	
	SDC Time & Materials		0.699	0.699	IBM
			-	-	WiPro
			-	-	DXC
			-	-	Verizon
	SDC Fixed-Price		-	-	IBM
			0.070	0.070	WiPro
			0.010	0.010	DXC
			0.020	0.020	Verizon
	All other personnel	0.421	-	0.421	
	TOTAL Personnel Costs	0.421	0.840	1.261	
Hardware	Purchase		-	-	
	Lease		-	-	
Software			-	-	
Risk Margin			0.060	0.060	
AFUDC			0.032	0.032	
Other			0.025	0.025	
TOTAL Costs		0.421	0.956	1.377	

4.3 Other Appendices

N/A

4.4 NPV Summary

N/A

US Sanction Paper**4.5 Customer Outreach Plan**

N/A

4.6 Benefiting Operating Companies

Operating Company Name	Business Area	State
Boston Gas Company	Gas Distribution	MA
Colonial Gas Company	Gas Distribution	MA

4.7 IT Ongoing Operational Costs (RTB):

This project will increase IT ongoing operations support costs as per the following table. These are also known as Run the Business (RTB) costs.

The known RTB cost at the time of this sanctioning for the implementation of Workstream 1. Other RTB costs related to Workstream 2 and 3 are expected and will be determined prior the final project sanctioning in August 2019.

all figures in \$ thousands						
INV ID:	4910				Date RTB Last Forecasted	03/25/2019
Investment Name:	MA DOR					
Project Manager:	Rich Balsano			PDM:	TBD	
All figures in \$ thousands	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Total
	FY 19/20	FY 20/21	FY 21/22	FY 22/23	FY 23/24	
Last Sanctioned Net Impact to RTB						
Last Sanction IS Net Impact to RTB						
Last Sanction Business Net Impact to RTB						
Last Sanction Total Net Impact to RTB	-	-	-	-	-	-
Planned/Budgeted Net Impact to RTB						
IS Investment Plan Net Impact to RTB						
Business Budgeted Net Impact to RTB						
Currently Forecasted Net Impact to RTB						
IS Funded Net Impact to RTB Forecasted at Go-Live	5.9	13.9	13.7	13.7	13.6	60.8
Business Funded Net Impact to RTB Forecasted at Go-Live	-	-	-	-	-	-
Variance to Planned/Budgeted Net Impact to RTB						
IS Investment Plan Net Impact to RTB Variance	(5.9)	(13.9)	(13.7)	(13.7)	(13.6)	(60.8)
Business Budgeted Net Impact to RTB Variance	-	-	-	-	-	-

Investment Proposal Summary Sheet

INVP 4910 MA DOR -CRIS

Request Date: 1/4/2019	Business Partner: Joel Semel	Author: Tejal Patel
Project Manager: Richard Balsano / Riziel Cruz-Bower	Program Delivery Director: Riziel Cruz-Bower	Sanction Type: Partial Sanction
Region: US	Category: Mandatory	Legal Entity: Shared
Risk Score: 49	Primary Driver: Reliability	Project Classification: M
Project Sponsor: Jody Allison, VP Billing and Collections Strategy	Program INVP – Description: N/A	

Sanction Summary:

This paper requests partial sanction of INVP 4910 in the amount \$0.310M with a tolerance of +/- 10% for the purposes of partial Requirements and Design (R-D).

This sanction amount is \$0.310M broken down into:

\$0.164M	CapEx
\$0.146M	OpEx
\$0.000M	Removal

NOTE the potential investment of \$0.759M with a tolerance of +/- 25%, contingent upon submittal and approval of a Project Sanction paper following completion of Requirements and Design.

Project Summary

This is a mandated project; The Massachusetts Department of Revenue (MA-DOR) is changing the way that it manages tax exemptions for small businesses. Starting in January 2019, Massachusetts taxpayers must use a web site to apply for a tax exemption. After the MA-DOR approves the exemption, it will provide a Tax Exemption Number to the taxpayer who will then contact the electric and/or gas utility and/or Energy Service Company (ESCO) to provide that number. National Grid will then confirm that the number is valid, store it, and produce the number during audits by MA-DOR. This project will address the changes required to the Customer Related Information System (CRIS), which is utilized to bill MA Gas customers. A separate paper will be raised to address changes to the Customer Service System (CSS).

Project Description

The MA-DOR is taking a generic approach intended for use by all energy providers. Taxpayers will go to the Mass Tax Connect website (<https://mtc.dor.state.ma.us/mtc/>) to apply for tax exemption and will be issued a Tax Exemption number after being approved by MA-DOR. Customers are responsible for contacting their energy provider(s) with the Tax Exemption number.

Any Tax Exemption number provided by a customer is accepted but considered pending until it is validated against MA-DOR records. Customer Service Reps will need to have a place to capture pending Tax Exemption number's that pertain to multiple customer account numbers (CSS, CRIS, and multiple premises). How the validation occurs depends on how MA-DOR shares this data.

During the validation process the pending Tax Exemption number should be looked up in the MA-DOR records. If the Tax Exemption Number is valid, then the customers exemption should be updated in CRIS with the MA-DOR effective and expiration date. If the Tax Exemption number is not valid then it should be saved to an exception file for Account Maintenance

Operations, AMO manual processing. A log of Tax Exemption number's processed should be kept indefinitely for future MA-DOR audits and as needed for customer disputes. When updating the effective/expiration dates in CRIS, the exception file and/or log should note accounts that need to be rebilled when those dates change the exemption status of bills already produced.

At any time, MA-DOR may audit taxpayers and determine that they are no longer exempt and will update that taxpayers expiration date so a daily process is also needed to review existing Tax Exemption numbers to see whether their expiration date has changed. The daily process should update CRIS with the MA-DOR expiration date and make the customer taxable. CRIS should store and display the latest exemption status. When updating the effective/expiration dates in CRIS the exception file and/or log should note accounts that need to be rebilled when those dates change the exemption status.

Background

The Massachusetts Department of Revenue (MA-DOR) is changing the way that they manage tax exemptions for small businesses. The old process involved tax payers providing a signed paper certificate to National Grid which had to be produced during audits by MA-DOR. Starting in January 2019, Massachusetts taxpayers will need to use a web site to apply for a tax exemption. After MA-DOR approves the exemption, they will provide a Tax Exemption Number to the taxpayer who will then contact their electric and/or gas utility and/or Energy Service Company to provide them with that number. National Grid will need to confirm that the number is valid, store it, and produce the number during audits by MA-DOR.

Project Costs [\$M]	Prior	FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	Total

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Information Technology Capital Investment Quarterly Report
Date: 1/4/2019
Fourth Quarter Ended August 31, 2019

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	FYs	18/19	19/20	20/21	21/22	22/23	23/24	
Start-Up OPEX								
Start-Up CAPEX								
Start-Up Risk Margin								
Start-Up SUBTOTAL								
Requirements & Design OPEX		0.146						0.146
Requirements & Design CAPEX		0.149						0.149
Requirements & Design Risk Margin		0.15						0.015
R&D SUBTOTAL		0.310						0.310
Development & Implementation – OPEX								
People			0.012					0.012
Software								
Hardware								
Telecommunications								
Service Contracts								
Risk Margin								
Development & Implementation – CAPEX								
People		0.265	0.148					0.413
Software								
Hardware								
Telecommunications								
Service Contracts								
Risk Margin			0.025					0.025
D&I SUBTOTAL		0.265	0.185					0.450
Total Project Opex		0.161	0.012					0.173
Total Project Capex		0.414	0.173					0.587
Total Project Cost		0.575	0.185					0.760
Non-regulated Project UPLIFT								
Non-regulated Project TOTAL								
IS Investment Plan FY19 thru FY23								
Budget OPEX		0.151	0.012					0.163
Budget CAPEX		0.428	0.173					0.601
Total Budget Cost		0.579	0.185					0.764
Total Cost Variance								
Total Variance Opex								
Total Variance Capex								
Total Variance Cost								
Impact on RTB costs								

Key Risks:	Key Dates	Date (Mmm/YYYY)
	Start Up	Sep/2018
	Partial Sanction	Jan/2019
	Requirements & Design	Oct/2018
	Develop & Implement	Feb/2019
	Move to Production / Last Go Live	Jun/2019
	Sanction Closure	Dec/2019

The supporters listed have aligned their part of the business to support the project.

Department	Individual	Responsibilities
Business Department	Jody Allison	Business Representative
Program Delivery Management (PDM)	Narayan Devireddy	Head of PDM
Business Partner (BP)	Joel Semel	Relationship Manager
Program Delivery Management (PDM)	Riziel Bower Cruz	Program Delivery Director
IT Finance	Michelle Harris	Manager
IT Regulatory	Tom Gill	Manager
Digital Risk and Security (DR&S)	Elaine Wilson	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director

RECOMMENDATIONS

The Sanctioning Authority is invited to:

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Information Technology Capital Investment Quarterly Report

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Fourth Quarter Ended August 31, 2019

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- a) APPROVE the investment of \$0.310M including risk margin of \$0.031M
- b) NOTE that Jody Allison, VP Billing and Collections Strategy, is the Project Sponsor
- c) NOTE that Riziel Cruz Bower, is the Project Manager and has the approved financial delegation to deliver the project

Decision of the Sanctioning Authority

I hereby approve the recommendations made in this paper.

Signature..... Date.....

Premjith Singh

VP IT Tower Lead – Gas Business Partner

National Grid Confidential

Information Technology Capital Expenditure Quarterly Report

Date: 1/4/2019

Fourth Quarter Ended August 31, 2019

Attachment 1

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Appendix A**Benefiting Operating Companies**

Operating Company Name	Business Area	State
Boston Gas Company	Gas Distribution	MA
Colonial Gas Company	Gas Distribution	MA



Short: US Sanction Paper

Title:	MA DOR - CSS	Sanction Paper #:	
Project #:	INVP 4910A	Sanction Type:	Sanction
Capex #:	5008004		
Operating Company:	National Grid USA Svc. Co.	Date of Request:	8/8/2019
Author:	Stallard, Susan	Sponsor(s):	McConnachie, Chris Vice President, Finance Services, Financ
Utility Service:	IT	Project Manager:	Cruz-Bower, Riziel

Executive Summary

This paper requests Sanction of INVP 4910A in the amount of \$0.940M with a tolerance of +/-10% for the purposes of Development and Implementation of work streams 2 and 3. .

This sanction amount is \$0.940M broken down into:

\$0.788M Capex
\$0.152M Opex
\$0.000M Removal

Project Summary

This is a mandated project; The Massachusetts Department of Revenue (MA-DOR) is changing the way that it manages tax exemptions for small businesses. Starting in January 2019, Massachusetts taxpayers must use a web site to apply for tax exemptions. The MA-DOR will approve the exemption and provide the taxpayer a Tax Exemption Number. The taxpayer is responsible for providing the tax exemption number to their utility provider (electric, gas, and/or Energy Service Company (ESCO)). National Grid is required to validate the number, retain and provide the number during audits by MA-DOR.

This project addresses the changes required to the Customer Service System (CSS), which is utilized to bill Massachusetts (MA) Electric customers. A separate project and sanction paper (INVP 4910 MA DOR – CRIS) will address changes to the Customer Response Information Systems (CRIS).

Background

Prior to January 2019 MA small business owners were responsible to provide a signed paper certificate for tax exemption. National Grid would store this certificate in the Avalara TEM system, as they were required to produce these certificates during audits conducted by the MA DOR. Starting in January 2019, MA taxpayers will use a web site (MA TaxConnect.com) to apply for a tax exemption. After MA-DOR approves the exemption, they will provide a Tax Exemption # (Ex#) to the taxpayer who will then contact their electric and/or gas utility and/or ESCO to provide them with that number.

Project Descriptions

This Project is comprised of three workstreams:

- Workstream 1 – Batch Automation of the Tax Agreement Review and Update Process.

This includes the web service call to MA DOR to verify the exemption number, status, effective date and expiration date.

- Workstream 2 – MA DOR Online Validation Automation
- Workstream 3 – Annual Billing Report

To meet the mandate, National Grid will roll out the following solution for the CSS application:

- Processes that will:
 - Provide the ability for Customer Service Reps to be able to capture pending Tax Exemption number
 - Validate the customer provided tax exemption number against the MA DOR web site
 - Verify the tax exemption is still valid
- Automate the CSS application to:
 - Update CSS with the validated tax exemption number
 - Update CSS with the effective and expiration dates from MA DOR
 - Update the customer tax exemption status
- Create Error Reports that identify unverified tax exemption numbers
- Create Exception Reports that:
 - Identify accounts that need to be manually rebilled due to the tax exemption dates / status changing, for bills already produced
 - Identify Accounts that the tax exemption expiration date has changed
 - Provide the ability to retain tax exemption numbers provided by the customer that cannot be validated
- Retain history of tax exemption status changes for auditing
- Perform end to end testing before go-live
- Deploy the solution into production
- Provide post production implementation support.

This solution to implement an automated process to meet the MA DOR mandate is the Minimum Alternative cost option.

Summary of Benefits

- Reduction of manual processing for customer abatements (refunds to customers for taxes paid inadvertently)
- Ability to meet mandated implementation timelines
- Reduction of stored Tax Exemption Certificates in the Avalara TEM system.
- Elimination of Small Business Energy Exemption Annual Campaign to renew tax certificates.
- Improved customer / taxpayer experience due to online form processing Improved customer / taxpayer experience due to online form processing

Business and Customer Issues

There are no significant business or customer issues beyond what has been described elsewhere.

Number	Title
1	<p>Business Area to process tax exemption status manually</p> <p>This option would require the Business Area to manually processes the tax exemption status of the MA utility customers. Without automation of the CSS application the Business is projecting they would need to hire and additional 73 full time employees.</p> <p>Rejected: This was rejected as the business would need to increase the staff to handle the manual process.</p> <p>Indicative Cost: \$4.315M per annum</p>
2	<p>Do nothing / Delay Investment</p> <p>To leave the CSS application as is, is not viable as the MA DOR has changed the way they will process tax exempt statuses for their utility customers. National Grid would be out of compliance and at risk of incorrectly billing their customers.</p> <p>Rejected: As National Grid must these updates are required to remain in compliance with mandate from the MA DOR.</p> <p>Indicative Cost: \$0.000M</p>

Associated Projects

Key Milestones	
Milestone	Date (Month / Year)
Start Up	September, 2018
Partial Sanction	January, 2019
Begin Requirements and Design	October, 2018
Partial Sanction	March, 2019
Begin Development and Implementation	March, 2019
Begin User Acceptance Testing	July, 2019
Project Sanction	August, 2019
Move to Production / Final Go Live	October, 2019
Project Closure Sanction	March, 2020
Next Planned Sanction	
Date (Month/Year)	Purpose of Sanction Review
March, 2020	Closure

Category

Category	Reference to Mandate, Policy, NPV, or Other
<input checked="" type="radio"/> Mandatory	This is a mandated project; The Massachusetts
<input type="radio"/> Policy-Driven	Department of Revenue (MA-DOR) is changing the
<input type="radio"/> Justified NPV	way that it manages tax exemptions for small
<input type="radio"/> Other	businesses

Asset Management Risk Score: 49

PRIMARY RISK SCORE DRIVER

☒ Reliability ☐ Environment ☐ Health & Safety ☐ Not Policy Driven

Complexity Level: 22

☐ High Complexity ☒ Medium Complexity ☐ Low Complexity ☐ N/A

Investment Recovery and Customer Impact

Investment Recovery

Recovery will occur at the time of the next rate case for any operating company receiving allocations of these costs.

Drivers

The MA -DOR is requiring that MA small businesses use a web site (MATaxConnect.com) to request tax exemption number for tax exemption status.

Statement of Support

Department	Individual	Responsibilities
Business Department	McConnachie, Chris	Business Representative
Business Partner (BP)	Semel, Joel	Relationship Manager
Program Delivery Management (PDM)	Cruz-Bower, Rziel	Program Delivery Director
IT Finance	Harris, Michelle	Manager
IT Regulatory	DeMauro, Daniel J.	Director
Digital Risk and Security (DR&S)	Shattuck, Peter	Manager
Service Delivery	Mirizio, Mark	Manager
Enterprise Architecture	Clinchot, Joseph J.	Director
Enterprise Portfolio Management	Cronin, Daniel	Analyst

Decisions

Recommendations

The Sanctioning Authority is invited to:

A) APPROVE the investment of \$0.940M including risk margin of \$0.04M

B) APPROVE the run-the-business (RTB) of \$0.014M(per annum) for 5 years

C) NOTE that McConnachie, Chris, Vice President, Finance Services, Financ is the Project Sponsor

D) NOTE that Cruz-Bower, Riziel, is the Project Manager and has the approved financial delegation to deliver the project

Decision of the Sanctioning Authority

I hereby approve the recommendations made in this paper.

Signature _____

Date _____

08/08/19

Premjith Singh

VP IT EPMO

Appendix

Project Costs [\$M]	Prior FYs	FY 1 18/19	FY 2 19/20	FY 3 20/21	FY 4 21/22	FY 5 22/23	FY 6 23/24	Total
Start-Up OPEX	-	-	-	-	-	-	-	-
Start-Up CAPEX	-	-	-	-	-	-	-	-
Start-Up - Risk OPEX	-	-	-	-	-	-	-	-
Start-Up - Risk CAPEX	-	-	-	-	-	-	-	-
Start-Up SUBTOTAL	-	-	-	-	-	-	-	-
R&D OPEX	-	0.071	-	-	-	-	-	0.071
R&D CAPEX	-	0.128	-	-	-	-	-	0.128
R&D Risk OPEX	-	-	-	-	-	-	-	-
R&D Risk CAPEX	-	-	-	-	-	-	-	-
R&D SUBTOTAL	-	0.199	-	-	-	-	-	0.199
Development & Implementation – OPEX								
People	-	0.003	0.071	-	-	-	-	0.074
Software	-	-	-	-	-	-	-	-
Hardware	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-
Risk Margin	-	-	0.007	-	-	-	-	0.007
Development & Implementation – CAPEX								
People	-	0.065	0.550	-	-	-	-	0.615
Software	-	-	-	-	-	-	-	-
Hardware	-	-	-	-	-	-	-	-
AFUDC	-	-	0.004	-	-	-	-	0.004
Other	-	-	0.020	-	-	-	-	0.020
Risk Margin	-	-	0.020	-	-	-	-	0.020
D&I SUBTOTAL	-	0.068	0.672	-	-	-	-	0.740
Total Project	-	-	-	-	-	-	-	-

Opex		0.074	0.078					0.152
Total Project Capex	-	0.193	0.594	-	-	-	-	0.788
Total Project Cost	-	0.267	0.672	-	-	-	-	0.940
Non-regulated project UPLIFT	-	-	-	-	-	-	-	-
Non-regulated project TOTAL	-	-	-	-	-	-	-	-
IS Investment Plan FY 18/19 Thru FY 23/24								
Budget OPEX	-	0.074	0.034	-	-	-	-	0.108
Budget CAPEX	-	0.194	0.573	-	-	-	-	0.767
Total Budget Cost	-	0.268	0.607	-	-	-	-	0.875
Total Cost Variance								
Total Variance Opex	-	0.000	(0.044)	-	-	-	-	(0.044)
Total Variance Capex	-	0.001	(0.021)	-	-	-	-	(0.021)
Total Variance Cost	-	0.001	(0.065)	-	-	-	-	(0.065)
Impact on RTB costs	-	-	0.004	0.014	0.014	0.014	0.014	0.060

BENEFITING OPERATING COMPANIES

Operating Company Name	Business Area	State
Boston Gas Company	Gas Distribution	MA
Colonial Gas Company	Gas Distribution	MA

all figures in \$ thousands

INV ID:	4910A	Date RTB Last Forecasted	07/19/2019
Investment Name:	MA DOR CSS		
Project Manager:	Rohit Grover	BP:	Riziel Cruz-Bower
	Yr. 1	Yr. 2	Yr. 3
	Yr. 4	Yr. 5	Total

All figures in \$ thousands	FY 19/20	FY 20/21	FY 21/22	FY 22/23	FY 23/24	
Last Sanctioned Net Impact to RTB						
Last Sanction IS Net Impact to RTB		7.0	16.0	16.0	16.0	55.0
Last Sanction Business Net Impact to RTB						-
Last Sanction Total Net Impact to RTB	-	7.0	16.0	16.0	16.0	55.0
Planned/Budgeted Net Impact to RTB						
IS Investment Plan Net Impact to RTB	-	30.0	30.0	30.0	30.0	120.0
Business Budgeted Net Impact to RTB						-
Currently Forecasted Net Impact to RTB						
IS Funded Net Impact to RTB Forecasted at Go-Live	3.5	14.0	14.0	14.0	14.0	59.5
Business Funded Net Impact to RTB Forecasted at Go-Live	-	-	-	-	-	-
Variance to Planned/Budgeted Net Impact to RTB						
IS Investment Plan Net Impact to RTB Variance	(3.5)	16.0	16.0	16.0	16.0	60.5
Business Budgeted Net Impact to RTB Variance	-	-	-	-	-	-

Investment Proposal Summary Sheet

INVP 4910A MA DOR - CSS

Request Date: 03/29/2019	Business Partner: Joel Semel	Author: Susan Stallard Teders
Project Manager: Rohit Grover	Program Delivery Director: Riziel Cruz-Bower	Sanction Type: Sanction
Region: US	Category: Mandatory	Legal Entity: Shared
Risk Score: 49	Primary Driver: Reliability	Project Classification: M
Project Sponsor: Jody Allison, VP Billing and Collections Strategy	Program INVP – Description: INVP 4910A MA DOR - CSS	

Sanction Summary

This paper requests sanction of INVP 4910A in the amount \$0.816M with a tolerance of +/- 10% for the purposes of Development and Implementation for Workstream 1 – Batch Automation of the Tax Agreement Review and Update Processes, and Development for Workstream 2 – MA DOR Online Validation Automation and Workstream 3 - Annual Billing Report.

This sanction amount is \$0.816M broken down into:

\$0.745M	CapEx
\$0.071M	OpEx
\$0.000M	Removal

NOTE the potential investment of \$0.948M with a tolerance of +/- 25%, contingent upon submittal and approval of a Project Sanction paper following completion of Workstream 1 – Batch Automation of the Tax Agreement, and Development for Workstream 2 - Online Automation for the MA DOR Validation Process and Workstream 3 – Annual Billing Report. The final sanction for this project will be for Testing and Implementation of Workstream 2 - Online Automation for the MA DOR Validation Process and Workstream 3 – Annual Billing Report.

Project Summary

This is a mandated project; The Massachusetts Department of Revenue (MA-DOR) is changing the way that it manages tax exemptions for small businesses. Starting in January 2019, Massachusetts taxpayers must use a web site to apply for tax exemptions. The MA-DOR will approve the exemption and provide the taxpayer a Tax Exemption Number. The taxpayer is responsible for providing the tax exemption number to their utility provider (electric, gas, and/or Energy Service Company (ESCO)). National Grid is required to validate the number, retain and provide the number during audits by MA-DOR.

This project addresses the changes required to the Customer Service System (CSS), which is utilized to bill Massachusetts (MA) Electric customers. A separate project and sanction paper (INVP 4910 MA DOR – CRIS) will address changes to the Customer Response Information Systems (CRIS).

Project Description

This Project is comprised of three workstreams:

- Workstream 1 – Batch Automation of the Tax Agreement Review and Update Process.

This includes the web service call to MA DOR to verify the exemption number, status, effective date and expiration date.

- Workstream 2 – MA DOR Online Validation Automation
- Workstream 3 – Annual Billing Report

To meet the mandate, National Grid will roll out the following solution for the CSS application:

- Processes that will:
 - Provide the ability for Customer Service Reps to be able to capture pending Tax Exemption number

- Validate the customer provided tax exemption number against the MA DOR web site
 - Verify the tax exemption is still valid
- Automate the CSS application to:
 - Update CSS with the validated tax exemption number
 - Update CSS with the effective and expiration dates from MA DOR
 - Update the customer tax exemption status
- Create Error Reports that identify unverified tax exemption numbers
- Create Exception Reports that:
 - Identify accounts that need to be manually rebilled due to the tax exemption dates / status changing, for bills already produced
 - Identify Accounts that the tax exemption expiration date has changed
 - Provide the ability to retain tax exemption numbers provided by the customer that cannot be validated
- Retain history of tax exemption status changes for auditing
- Perform end to end testing before go-live
- Deploy the solution into production
- Provide post production implementation support.

This solution to implement an automated process to meet the MA DOR mandate is the Minimum Alternative cost option.

Background

Prior to January 2019 MA small business owners were responsible to provide a signed paper certificate for tax exemption. National Grid would store this certificate in the Avalara TEM system, as they were required to produce these certificates during audits conducted by the MA DOR. Starting in January 2019, MA taxpayers will use a web site (MA TaxConnect.com) to apply for a tax exemption. After MA-DOR approves the exemption, they will provide a Tax Exemption # (Ex#) to the taxpayer who will then contact their electric and/or gas utility and/or ESCO to provide them with that number.

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Information Technology Capital Investment Quarterly Report
Date: 03/15/2019
Fourth Quarter Ended August 31, 2019

Project Costs [\$M]	Prior FYs	FY 1 19/20	FY 2 20/21	FY 3 21/22	FY 4 22/23	FY 5 23/24	FY 6 24/25	Attachment 11 Total Page 80 of 105
Start-Up OPEX								
Start-Up CAPEX								
Start-Up Risk OPEX								
Start-Up Risk CAPEX								
Start-Up SUBTOTAL								
R&D OPEX	0.071							0.071
R&D CAPEX	0.128							0.128
R&D Risk OPEX								
R&D Risk CAPEX								
R&D SUBTOTAL	0.199							0.199
Development & Implementation – OPEX								
People		0.066						0.066
Software								
Hardware								
Other								
Risk Margin								
Development & Implementation – CAPEX								
People	0.065	0.547						0.612
Software								
Hardware								
AFUDC	0.001	0.018						0.019
Other	0.002	0.006						0.008
Risk Margin		0.040						0.040
D&I SUBTOTAL	0.068	0.677						0.745
Total Project Opex	0.071	0.066						0.137
Total Project Capex	0.196	0.611						0.807
Total Project Cost	0.267	0.677						0.944
Non-regulated Project UPLIFT								
Non-regulated Project TOTAL	0.267	0.677						0.944
IS Investment Plan FY19 thru FY23								
Budget OPEX	0.071	0.034						0.105
Budget CAPEX	0.196	0.573						0.769
Total Budget Cost	0.267	0.607						0.874
Total Cost Variance								
Total Variance Opex	0.000	0.032						0.032
Total Variance Capex	0.000	0.038						0.038
Total Variance Cost	0.000	0.070						0.070
Impact on RTB costs			0.007	0.016	0.016	0.016	0.016	0.072

Benefiting Operating Companies

See Appendix A

Alternatives

Alternative 1: Business Area to process tax exemption status manually.

This option would require the Business Area to manually processes the tax exemption status of the MA utility customers. Without automation of the CSS application the Business is projecting they would need to hire and additional 73 full time employees.

Rejected: This was rejected as the business would need to increase the staff to handle the manual process.

Indicative Cost: \$4.315M per annum

Alternative 2: Do nothing / Delay Investment

To leave the CSS application as is, is not viable as the MA DOR has changed the way they will process tax exempt statuses for their utility customers. National Grid would be out of compliance and at risk of incorrectly billing their customers.

Rejected: As National Grid must these updates are required to remain in compliance with mandate from the MA DOR.

Indicative Cost: \$0.000M

TOTAL BENEFITS \$M								
Key Business Benefits: <ul style="list-style-type: none"> ➤ Reduction of manual processing for customer abatements (refunds to customers for taxes paid inadvertently) ➤ Ability to meet mandated implementation timelines ➤ Reduction of stored Tax Exemption Certificates in the Avalara TEM system. ➤ Elimination of Small Business Energy Exemption Annual Campaign to renew tax certificates. ➤ Improved customer / taxpayer experience due to online form processing 								

Key Risks: <ul style="list-style-type: none"> • Availability of internal business resources to review requirements perform Unit Acceptance Testing, due to shortage of staff, several projects in tandem and daily tasks. • Scope may potentially change if the MA DOR technical personnel do not finalize the designing of the requirements 	Key Dates	Date (Mmm/YYYY)
	Start Up	Sep/2018
	Partial Sanction	Jan/2019
	Requirements & Design	Oct/2018
	Project Sanction	Mar/2019
	Begin Development – Workstreams 1, 2, 3	Mar/2019
	Begin User Acceptance Testing - workstream 1	Jul/2019
	Project Sanction	Aug/2019
	Begin User Acceptance Testing – Workstream 2, 3	Sep/2019
	Move to Production / Last Go Live	Oct/2019
	Closure Sanction	Jan/2020

The supporters listed have aligned their part of the business to support the project.

Department	Individual	Responsibilities
Business Department	Jody Allison	Business Representative
Business Partner (BP)	Joel Semel	Relationship Manager
Program Delivery Management (PDM)	Riziel Bower-Cruz	Program Delivery Director
IT Finance	Michelle Harris	Manager
IT Regulatory	Tom Gill	Manager
Digital Risk and Security (DR&S)	Peter Shattuck	Manager
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director

National Grid Confidential

Information Technology Capital Investment Quarterly Report
Date: 03/15/2019

RECOMMENDATIONS

The Sanctioning Authority is invited to:

- a) APPROVE the investment of \$0.816M including risk margin of \$0.040M
- b) APPROVE the run-the-business (RTB) of \$0.007M for FY20 and \$0.016 (per annum) for 4 years
- c) NOTE that Jody Allison, VP Billing and Collections Strategy, is the Project Sponsor.
- d) NOTE that Riziel Cruz-Bower, is the Project Manager and has the approved financial delegation to deliver the project

Decision of the Sanctioning Authority

I hereby approve the recommendations made in this paper.

Signature..... Date.....

Premjith Singh
VP IT Tower Lead – Gas Business Partner

Appendix A

Benefiting Operating Companies

Operating Company Name	Business Area	State
Massachusetts Electric Company	Electric Distribution	MA
Nantucket Electric Company	Electric Distribution	MA

Appendix B

This project will increase IT ongoing operations support costs as per the following table. These are also known as Run the Business (RTB) costs.

The known RTB cost at the time of this sanctioning for the implementation of Workstream 1. Other RTB costs related to Workstream 2 and 3 are expected and will be determined prior the final project sanctioning in September 2019.

all figures in \$ thousands						
INV ID:	4910A				Date RTB Last Forecasted	03/25/2019
Investment Name:	MA DOR - CSS					
Project Manager:	Cindy Tomeny/Rohit Grover			PDM:	TBD	
All figures in \$ thousands	Yr. 1 FY 19/20	Yr. 2 FY 20/21	Yr. 3 FY 21/22	Yr. 4 FY 22/23	Yr. 5 FY 23/24	Total
Last Sanctioned Net Impact to RTB						
Last Sanction IS Net Impact to RTB						-
Last Sanction Business Net Impact to RTB						-
Last Sanction Total Net Impact to RTB	-	-	-	-	-	-
Planned/Budgeted Net Impact to RTB						
IS Investment Plan Net Impact to RTB	-	-	-	-	-	-
Business Budgeted Net Impact to RTB						-
Currently Forecasted Net Impact to RTB						
IS Funded Net Impact to RTB Forecasted at Go-Live	6.7	16.2	15.8	15.5	15.3	69.5
Business Funded Net Impact to RTB Forecasted at Go-Live	-	-	-	-	-	-
Variance to Planned/Budgeted Net Impact to RTB						
IS Investment Plan Net Impact to RTB Variance	(6.7)	(16.2)	(15.8)	(15.5)	(15.3)	(69.5)
Business Budgeted Net Impact to RTB Variance	-	-	-	-	-	-

Investment Proposal Summary Sheet INVP 4910A MA DOR - CSS

Request Date: 1/4/2019	Business Partner: Joel Semel	Author: Tejal Patel
Project Manager: Cindy Tomeny/Riziel Cruz-Bower	Program Delivery Director: Riziel Cruz-Bower	Sanction Type: Partial Sanction
Region: US	Category: Mandatory	Legal Entity: Shared
Risk Score: 49	Primary Driver: Reliability	Project Classification: M
Project Sponsor: Jody Allison, VP Billing and Collections Strategy	Program INVP – Description: NA	

Sanction Summary:

This paper requests partial sanction of INVP 4910A in the amount \$0.202M with a tolerance of +/- 10% for the purposes of partial Requirements and Design (R-D).

This sanction amount is \$0.202M broken down into:

\$0.115M	CapEx
\$0.087M	OpEx
\$0.000M	Removal

NOTE the potential investment of \$0.566M with a tolerance of +/- 25%, contingent upon submittal and approval of a Project Sanction paper following completion of Requirements and Design.

Project Summary

This is a mandated project; The Massachusetts Department of Revenue (MA-DOR) is changing the way that it manages tax exemptions for small businesses. As of January 2019, Massachusetts taxpayers must use a web site to apply for a tax exemption. After the MA-DOR approves the exemption, it will provide a Tax Exemption Number to the taxpayer who will then contact the electric and/or gas utility and/or Energy Service Company (ESCO) to provide that number. National Grid will then confirm that the number is valid, store it, and produce the number during audits by MA-DOR. This will require the changes in the Customer Service System, CSS for MA Electric customers. This sanction paper will address CSS changes, INVP 4910 will address Customer Response Information Systems, CRIS changes.

Project Description

The MA-DOR is taking a generic approach intended for use by all energy providers. Taxpayers will go to the Massachusetts Tax Connect website (<https://mtc.dor.state.ma.us/mtc/>) to apply for tax exemption and will be issued a Tax Exemption number after being approved by MA-DOR. Customers are responsible for contacting their energy provider(s) with the Tax Exemption number.

Any Tax Exemption number provided by a customer is accepted but considered pending until it is validated against MA-DOR records. Customer Service Representatives will need to have a place to capture pending Tax Exemption number's that pertain to multiple customer account numbers (CSS multiple premises). How the validation occurs depends on how MA-DOR shares this data.

During the validation process the pending Tax Exemption number should be looked up in the MA-DOR records. If the Tax Exemption Number is valid, then the customer's exemption should be updated in CSS with the MA-DOR effective and expiration date. If the Tax Exemption number is not valid then it should be saved to an exception file for Account Maintenance Operations, AMO manual processing. A log of Tax Exemption numbers processed should be kept indefinitely for future MA-DOR audits and as needed for customer disputes. When updating the effective/expiration dates in CSS, the exception file

and/or log should note accounts that need to be rebilled when those dates change the exemption status of bills already produced.

At any time, MA-DOR may audit taxpayers and determine that they are no longer exempt and will update that taxpayers' expiration date so a daily process is also needed to review existing Tax Exemption numbers to see whether their expiration date has changed. The daily process should update CSS with the MA-DOR expiration date and make the customer taxable. CSS should store and display the latest exemption status. When updating the effective/expiration dates in CSS the exception file and/or log should note accounts that need to be rebilled when those dates change the exemption status of bills already produced.

Background

The Massachusetts Department of Revenue (MA-DOR) is changing the way that they manage tax exemptions for small businesses. The old process involved tax payers providing a signed paper certificate to National Grid which had to be produced during audits by MA-DOR. Starting in January 2019, Massachusetts taxpayers will need to use a web site to apply for a tax exemption. After MA-DOR approves the exemption, they will provide a Tax Exemption Number to the taxpayer who will then contact their electric and/or gas utility and/or Energy Service Company to provide them with that number. National Grid will need to confirm that the number is valid, store it, and produce the number during audits by MA-DOR.

Project Costs [\$M]	Prior	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Total
---------------------	-------	------	------	------	------	------	------	-------

National Grid Confidential

Information Technology Capital Investment Quarterly Report
Date: 1/4/2019
Fourth Quarter Ended August 31, 2019

Attachment 11
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	Yrs	18/19	19/20	20/21	21/22	22/23	23/24	
Start-Up - OPEX								
Start-Up - CAPEX								
Start-Up - Risk Margin								
Start-Up SUBTOTAL								

Requirements & Design OPEX		0.069						0.069
Requirements & Design CAPEX		0.115						0.115
Requirements & Design Risk Margin		0.018						.0018
R&D SUBTOTAL		0.202						0.202

Development & Implementation – OPEX								
People		.002	0.027					0.029
Software								
Hardware								
Telecommunications								
Service Contracts								
Risk Margin								
Development & Implementation – CAPEX								
People		0.197	0.113					0.310
Software								
Hardware								
Telecommunications								
Service Contracts								
Risk Margin			0.025					0.025
D&I SUBTOTAL								
TOTAL PROJECT COSTS		0.401	0.165					0.566
Total Project Opex		0.089	.027					0.116
Total Project Capex		0.312	0.138					0.450
Total Project Cost		0.401	0.165					0.566

Non-regulated project UPLIFT								
Non-regulated project TOTAL								

IS Investment Plan FY19 thru FY23								
Budget OPEX		0.071	0.027					0.098
Budget CAPEX		0.337	0.138					0.475
Total Budget Cost		0.408	0.165					0.573

Total Cost Variance								
Total Variance Opex								
Total Variance Capex								
Total Variance Cost								

National Grid Confidential

Information Technology Capital Expenditure Quarterly Report

Date: 1/4/2019
Fourth Quarter Ended August 31, 2019

Attachment 11

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Impact on RTB costs	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
---------------------	-----	-----	-----	-----	-----	-----	-----	-----

Benefiting Operating Companies

See Appendix A

Alternatives

Alternative 1: Do Nothing: Defer Project

This alternative was not selected for the following reasons:

Required compliance with Massachusetts Department of Revenue mandate

TOTAL BENEFITS \$M								
Key Business Benefits:								

Key Risks:	Key Dates	Date (Mmm/YYYY)
	Start Up	Sep/2018
	Partial Sanction	Jan/2019
	Requirements & Design	Oct/2018
	Develop & Implement	Feb/2019
	Move to Production / Last Go Live	Jun/2019
	Sanction Closure	Dec/2019

The supporters listed have aligned their part of the business to support the project.

Department	Individual	Responsibilities
Business Department	Jody Allison	Business Representative
Program Delivery Management (PDM)	Narayan Devireddy	Head of PDM
Business Partner (BP)	Joel Semel	Relationship Manager
Program Delivery Management (PDM)	Riziel Bower Cruz	Program Delivery Director
IT Finance	Michelle Harris	Manager
IT Regulatory	Tom Gill	Manager
Digital Risk and Security (DR&S)	Elaine Wilson	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director

RECOMMENDATIONS

The Sanctioning Authority is invited to:

- a) APPROVE the investment of \$0.202M including risk margin of \$0.018M
- b) APPROVE the run-the-business (RTB) is TBD (per annum) for 5 years
- c) NOTE that Jody Allison, VP Billing and Collections Strategy, is the Project Sponsor.
- d) NOTE that Riziel Cruz Bower, is the Project Manager and has the approved financial delegation to deliver the project

Decision of the Sanctioning Authority

I hereby approve the recommendations made in this paper.

Signature..... Date.....

Premjith Singh
VP IT Tower Lead – Gas Business Partner

Appendix A

Benefiting Operating Companies

Operating Company Name	Business Area	State
Massachusetts Electric Company	Electric Distribution	MA
Nantucket Electric Company	Electric Distribution	MA



US Sanction Paper

Title:	EMS Lifecycle Hardware and Software Upgrade	Sanction Paper #:	USSC-17-374 v3
Project #:	INVP 4914 Capex: S007766	Sanction Type:	Partial Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	3/25/2019
Author:	Lynn McLaren	Sponsor:	John Spink, VP Control Center Operations
Utility Service:	IT	Project Manager:	Lynn McLaren

1 Executive Summary

1.1 **Sanctioning Summary**

This paper requests partial sanction of INVP 4914 in the amount of \$18.117M with a tolerance of +/- 10% for the purposes of Partial Development and Implementation (D-I) through the completion of New England Site Acceptance Testing.

This sanction amount is \$18.117M broken down into:

\$15.384M Capex

\$ 2.733M Opex

\$ 0.000M Removal

NOTE the potential investment of \$23.595M with a tolerance of +/- 25%, contingent upon submittal and approval of a Project Sanction paper following completion of New England Site Acceptance Testing.

1.2 **Project Summary**

The hardware and software supporting the Energy Management System (EMS) and related networks is approaching end-of-life and creating risk to National Grid. During the execution of this investment, nearly 70% of the Critical National Infrastructure (CNI) networking assets will be at "End of Support/ End of Life", with no ability to obtain vendor assistance to resolve problems, and limited or no ability to procure required replacement parts. Upgrade of the current EMS requires replacement of the application and networking hardware, as these legacy assets are incompatible with current software releases. Without vendor supported assets, National Grid is at risk of not being able to recover from a system failure, resulting in the inability of operations to monitor and control the transmission and distribution electric systems, and the potential for customer service interruptions.

This investment will deploy hardware and software purchased under investments "INVP 4568-EMS Lifecycle Hardware and Software Upgrade" and "INVP 4570-Tech Services-Network Equipment Lifecycle Replacements" to the electric control rooms in New York



US Sanction Paper

and New England thereby mitigating the risk associated with these assets. An upgrade of the EMS application to the current supported version will benefit the business through increased capacity to support new initiatives, such as the Grid Modernization, the New York Reforming the Energy Vision and the ability to interconnect more with the growing distributed generation programs and monitor system impacts.

1.3 Summary of Projects

Project Number	Project Type (Elec only)	Project Title	Estimate Amount (\$M)
INVP 4914 Capex: S007766	Project Type	EMS Lifecycle Hardware and Software Upgrade	23.595
Total			23.595

1.4 Associated Projects

Project Number	Project Title	Estimate Amount (\$M)
4568	EMS Lifecycle Hardware and Software Upgrade	3.725
4570	Tech Services-Network Equipment	10.565
Total		14.290

1.5 Prior Sanctioning History

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Sanction Type	Potential Investment Tolerance
5/29/18	SESC	\$19.165M	\$30.530M	Partial	+/- 25%
12/13/17	USSC	\$4.734M	\$16.000M	Partial	+/- 25%

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
November 2019	Project Sanction

US Sanction Paper**1.7 Category**

Category	Reference to Mandate, Policy, NPV, or Other
<input type="radio"/> Mandatory <input checked="" type="radio"/> Policy- Driven <input type="radio"/> Justified NPV <input type="radio"/> Other	Maintain CNI Energy Management Systems at vendor supported version levels, hardware and operating systems. Supportability is imperative in meeting business defined Service Level Agreements (SLAs), "New England Energy Management System" and "New York Energy Management System", National Grid Information Security Management Standards (ISMS) 120 Critical National Infrastructure (CNI) and North American Electric Reliability Corporation Critical Infrastructure Protection (NERC CIP) Compliance policies (CIP-002-5.1a, CIP-003-6, CIP-004-6, CIP-005-5, CIP-006-6, CIP-007-6, CIP-008-5, CIP-009-6, CIP-010-2, CIP-011-2, and CIP-014-2).

1.8 Asset Management Risk ScoreAsset Management Risk Score: 44**Primary Risk Score Driver:** (Policy Driven Projects Only)
☒ Reliability ☐ Environment ☐ Health & Safety ☐ Not Policy Driven
1.9 Complexity Level
☐ High Complexity ☒ Medium Complexity ☐ Low Complexity ☐ N/A
Complexity Score: 21**1.10 Process Hazard Assessment**

A Process Hazard Assessment (PHA) is required for this project:

☐ Yes ☒ No



US Sanction Paper

1.11 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
IT Investment Plan FY20 - 24	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Over <input checked="" type="radio"/> Under <input type="radio"/> NA	\$1.249M

1.12 If cost > approved Business Plan how will this be funded?

N/A

1.13 Current Planning Horizon

\$M	Prior Yrs	Current Planning Horizon						Total
		Yr. 1 2019/20	Yr. 2 2020/21	Yr. 3 2021/22	Yr. 4 2022/23	Yr. 5 2023/24	Yr. 6 + 2024/25	
CapEx	11.355	6.538	1.416	0.000	0.000	0.000	0.000	19.309
OpEx	2.124	1.442	0.720	0.000	0.000	0.000	0.000	4.286
Total	13.479	7.980	2.136	0.000	0.000	0.000	0.000	23.595

1.14 Key Milestones

Milestone	Target Date: (Month Year)
Start Up	September 2017
Partial Sanction 1	December 2017
Begin Requirements and Design	January 2018
Partial Sanction 2	May 2018
Begin Development and Implementation	May 2018
Partial Sanction 3	March 2019
Begin Site Acceptance Testing	April 2019
Project Sanction	November 2019
Move to Production / Last Go Live	May 2020
Project Closure	November 2020

US Sanction Paper**1.15 Resources, Operations and Procurement**

Resource Sourcing			
Engineering & Design Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Construction/Implementation Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Resource Delivery			
Availability of internal resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Availability of external resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Operational Impact			
Outage impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Procurement Impact			
Procurement impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green

1.16 Key Issues (include mitigation of Red or Amber Resources)

N/A

1.17 Climate Change

Contribution to National Grid's 2050 80% emissions reduction target:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative
Impact on adaptability of network for future climate change:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative

1.18 List References

N/A



US Sanction Paper

2 Decisions

The Senior Executive Sanctioning Committee (SESC) at a meeting held on 03/25/2019:

- (a) APPROVED this paper and the investment of \$18.117M and a tolerance of +/- 10% for the purposes of New England Site Acceptance Testing.
- (b) NOTED the potential run-the-business (RTB) impact of \$0.344 for FY 2021 and \$1.357M (per average annum) for the remaining four years.
- (c) NOTED the potential investment \$23.595M and a tolerance of +/- 25%, contingent upon submittal and approval of a Project Sanction paper following completion of requirements and design.
- (d) NOTED that Michelle McNaught has the approved financial delegation to undertake the activities stated in (a).

Signature.....Date.....

Margaret Smyth

US Chief Financial Officer

Chair, Senior Executive Sanctioning Committee

US Sanction Paper**3 Sanction Paper Detail**

Title:	EMS Lifecycle Hardware and Software Upgrade	Sanction Paper #:	USSC-17-374 v3
Project #:	INVP 4914 Capex: S007766	Sanction Type:	Partial Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	3/25/2019
Author:	Lynn McLaren	Sponsor:	John Spink, VP Control Center Operations
Utility Service:	IT	Project Manager:	Lynn McLaren

3.1 Background

The existing computing hardware and software supporting the New York and New England CNI Energy Management System (EMS) is near end-of-life and at risk of running unsupported versions of operating systems and software. A capacity limitation of the current configuration is limiting the system's ability to respond to growing demands, including in the distributed generation area. Running the EMS systems on this hardware and software leaves National Grid at risk of losing visibility of the grid and potentially losing control of remotely operated devices and equipment which impacts the reliability of customer service. A failure could cause both reputational and financial impacts to National Grid from both our regulators and governmental agencies.

National Grid has a significant number of network and security related devices within the Critical National Infrastructure (CNI) environment that are also at End of Support (EoS). Running the network on this hardware and software leaves National Grid at risk of potential irrecoverable hardware failures or cyber threats due to outdated versions of software. Failure of the CNI networks could cause System Operators to lose control of electric transmission and distribution assets.

These mission critical computing assets require a refresh of infrastructure hardware and software to continue operating at the highest level of availability. The IT delivery team has determined, due to the interdependence of the EMS systems and CNI networks, that deployment of refreshed assets must be performed concurrently. Hardware and software purchased under investments "INVP 4568-EMS Lifecycle Hardware and Software Upgrade" and "INVP 4570-Tech Services-Network Equipment Lifecycle Replacements" will be deployed under this investment.



US Sanction Paper

3.2 Drivers

Key Business Drivers:

- Maintain EMS reliability in support of Control Center Operations
- Preserve the reputation of National Grid by maintaining system availability
- Aid in quicker restoration to customers in the event of outages
- Maintain EMS on the latest supported hardware and software, which preserves manufacturers support through maintenance agreements
- Safeguard the reliability of networks and therefore the Company's ability to effectively operate EMS, provide timely and accurate regulatory reporting, and provide customer facing outage information during storms
- Without an upgrade to supported levels of networking hardware and software, National Grid will not be able to deploy security patches, leaving National Grid vulnerable to cyber threats and at risk of NERC CIP non-compliance
- Accommodate increasing requirement for electric system data driven by Distributed Generation program growth

3.3 Project Description

This investment will deliver the following:

- Configure, test, and deploy hardware to refresh the EMS application infrastructure purchased under "INVP 4568-EMS Lifecycle Hardware and Software Upgrade" for Quality Assurance (QA) and production environments
- Configure, test and deploy hardware to refresh the CNI Networking assets purchased under "INVP 4570-Tech Services-Network Equipment Lifecycle Replacements" for test and production environments in the CNI Data Centers, Communications rooms, Operations Centers, and Support areas across the National Grid service territory in New York and New England as per the approved design
- Upgrade the current EMS application from version 5.5 to the current and supported release v9.2
- Purchase and deploy additional hardware required to perform the EMS application upgrade and required to meet Regulatory/Compliance needs
- Development and testing of the interfaces (PI Historian, Energy Accounting System, Thin Client) in scope
- Demonstrate successful testing of the data conversion and migration of legacy database and displays
- Testing of end-to-end system connectivity and solution setup
- Perform end to end and performance testing before Go-Live
- Demonstrate successful Disaster Recovery testing
- Change Management and Training support
- Complete Service Transition into production to the CNI IT team



US Sanction Paper

- Roll out the following solution to the Control Centers

This project will be delivered using National Grid US CNI, Information Technology, and Verizon resources.

3.4 Benefits Summary

Benefits of this investment include:

- Ready the CNI data centers and associated Wide Area Network infrastructure to support the refreshed system
- Provide increased capacity of the EMS databases to accommodate future growth in National Grid territories receiving Supervisory Control and Data Acquisition (SCADA) data. This helps National Grid stay compliant with regulatory requirements to share transmission SCADA data with regional Independent System Operators (ISOs) and interconnecting utilities
- Increase the reliability and integrity of the EMS application and CNI networks in New York and New England
- Deliver increased capacity in the EMS application to capture information from new devices, particularly distributed generation
- Provide quicker restoration to customers in the event of outages
- Prevent network outages which would impact regulatory availability requirements
- Provide a more robust network security environment, which allows National Grid to continue meeting the North American Electric Reliability Corporation Critical Infrastructure Protection (NERC CIP) requirements
- Mitigate risks associated with unsupported hardware and software affecting National Grids ability to effectively monitor, operate and control the electric bulk power supply systems

3.5 Business and Customer Issues

There are no significant business issues beyond what has been described elsewhere.

3.6 Alternatives

Alternative 1: Delay the Project

This alternative is not a viable option, because it puts the existing system at risk of system failure from operational failure or security compromise. Operating system security patches will be unavailable for workstations and servers after January 2020, with potential for regulatory compliance failure and exposure to security vulnerabilities. Existing hardware is not available to purchase as replacements for failed equipment. Support contracts are not available for much of the existing system equipment. The

US Sanction Paper

existing application software is not current with the vendor baseline and a new version requires operating system and hardware upgrades. The system must be upgraded to support grid modernization projects scheduled for 2019-2020.

Alternative 2: Move forward with a Software only project, without new Hardware

This alternative is not a viable option. A current version of vendor application software requires hardware and operating system upgrades.

Alternative 3: Move forward with a new Hardware only project, without new Software

This is not a viable option. Application software must be upgraded to expand the database and software capability required for ongoing projects. Additional cost would be required to downgrade operating systems and pay the application vendor to port software to the newer hardware. The existing software does not support the grid modernization initiatives.

3.7 Safety, Environmental and Project Planning Issues

There are no significant issues beyond what has been described elsewhere.

3.8 Execution Risk Appraisal

Risk Breakdown Structure Category	Qualitative Assessment / Risk Response Strategy					Risk Score
	Risk ID + Title	IF Statement	THEN Statement	Risk Response Strategy		
18. Specific Risk	R1 - Defect discovered during software testing	IF one or several defects are found during software testing and are not resolved prior to cutovers	THEN the project might require additional funding and time	Mitigate	Risk money budgeted to cover an additional month of resource costs if needed fixes are delayed.	9
18. Specific Risk	R2 - Additional penetration testing may be required or defects discovered	IF one or several defects are found during security assessment testing and are not resolved prior to final penetration testing	THEN the project may require an additional round of penetration testing which might require additional funding	Mitigate	The project has planned a risk budget that could be used to cover this expense if the need materializes.	9
18. Specific Risk	R3 - Resources unavailable per project requirement	IF resources are not available for project work	THEN the project may require additional timing and funding	Mitigate	The project schedule and budget have some contingency cost and timing built into the plan.	9
18. Specific Risk	R4 - High volume of defects	IF high volume of defects are discovered since the version of the product is not in full use with other customers	THEN multiple rounds of testing may be required	Mitigate	General risk money will be used to address this risk if it becomes an actual problem. Schedule will be reviewed for potential areas of simultaneous efforts.	12

3.9 Permitting

N/A



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3.10 Investment Recovery

3.10.1 Investment Recovery and Regulatory Implications

Recovery will occur at the time of the next rate case for any operating company receiving allocations of these costs.

3.10.2 Customer Impact

N/A

3.10.3 CIAC / Reimbursement

N/A

3.11 Financial Impact to National Grid

3.11.1 Cost Summary Table

Project Number	Project Title	Project Estimate Level (%)	Spend (\$M)	Prior Yrs	Current Planning Horizon						Total
					Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
					2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	
INVP 4914 Capex: S007766	EMS Lifecycle Hardware and Software Upgrade	Est Lvl (e.g. +/- 10%)	CapEx	11.355	6.538	1.416	0.000	0.000	0.000	0.000	19.309
			OpEx	2.124	1.442	0.720	0.000	0.000	0.000	0.000	4.286
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	13.479	7.980	2.136	0.000	0.000	0.000	0.000	23.595



US Sanction Paper

3.11.2 Project Budget Summary Table

Project Costs per Business Plan

		Current Planning Horizon						
		Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +
\$M	(Actual)	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	Total
CapEx	11.355	6.960	0.919	0.000	0.000	0.000	0.000	19.234
OpEx	2.124	2.122	1.364	0.000	0.000	0.000	0.000	5.610
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	13.479	9.082	2.283	0.000	0.000	0.000	0.000	24.844

Variance (Business Plan-Project Estimate)

		Current Planning Horizon						
		Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +
\$M	(Actual)	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	Total
CapEx	0.000	0.422	(0.497)	0.000	0.000	0.000	0.000	(0.075)
OpEx	0.000	0.680	0.644	0.000	0.000	0.000	0.000	1.324
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	1.102	0.147	0.000	0.000	0.000	0.000	1.249

3.11.3 Cost Assumptions

This estimate was developed in 2019 using the standard IS estimating methodology which includes a reassessment of project resource needs for a multi-year basis. Examples of these resource needs include hardware, software, internal and contract labor required to deliver the project. The accuracy level of estimate for each project is identified in Table 3.11.1

3.11.4 Net Present Value / Cost Benefit Analysis

This is not an NPV project.

3.11.4.1 NPV Summary Table

N/A

3.11.4.2 NPV Assumptions and Calculations

N/A

3.11.5 Additional Impacts

None



US Sanction Paper

3.12 Statements of Support

3.12.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Department	Individual	Responsibilities
Business Department	Phil LaVallee	Director
IT Business Partner (BP)	Bob Lorkiewicz	Director
Program Delivery Management (PDM)	Michelle McNaught	Program Delivery Director
IT Finance	Richard Quirk	Manager
IT Regulatory	Dan DeMauro	Director
Digital Risk and Security (DR&S)	Peter Shattuck	Lead Architect Security
Service Delivery (RTB)	Mark Mirizio	Manager
Enterprise Architecture	Svetlana Lyba	Director

3.12.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Function	Individual
Regulatory	Harvey, Maria
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate – FERC	Hill, Terron
Procurement	Chevere, Diego

4 Appendices

4.1 Sanction Request Breakdown by Project

\$M	INVP 4914 Capex: \$007766
CapEx	15.384
OpEx	2.733
Removal	
Total	18.117

US Sanction Paper**4.2 Project Cost Breakdown**

Project Cost Breakdown \$ (millions)					
Cost Category	sub-category	Value of Work to Date (VOWD)	Forecast to Complete (FTC)	Forecast At Completion (FAC=VOWD+FTC)	Name of Firm(s) providing resources
Personnel	NG Resources	1.372	3.690	5.062	
	SDC Time & Materials	0.324	0.189	0.513	
			-	-	
			-	-	
		0.000	0.434	0.434	
	SDC Fixed-Price		-	-	
			-	-	
			-	-	
			-	-	
	All other personnel	2.762	3.249	6.011	
	TOTAL Personnel Costs	4.459	7.562	12.020	
Hardware	Purchase	3.549	1.314	4.863	
	Lease		-	-	
Software		0.380	-	0.380	
Risk Margin			1.244	1.244	
AFUDC		0.254	1.498	1.752	
Other		0.746	2.591	3.336	
TOTAL Costs		9.387	14.208	23.595	

4.3 NPV Summary

N/A

4.4 Customer Outreach Plan

N/A



US Sanction Paper

4.5 Benefiting Operating Companies

The following companies will benefit from this program.

SAP Alloc. Code	SAP Co./Seg	Company Description	Capex	T&D O&M	Total T&D Expenditures	%
T-186	5210E	Niagara Mohawk Power Corp. - Electric Distr.	292,980,918	312,691,342	605,672,261	20.04%
T-186	5210T	Niagara Mohawk Power Corp. - Transmission	210,200,447	224,341,777	434,542,224	14.38%
T-186	5310E	Massachusetts Electric Company	328,110,189	1,046,066,794	1,374,176,983	45.48%
T-186	5310T	Massachusetts Electric Company (Transmission)	4,932,555	15,725,760	20,658,315	0.68%
T-186	5320E	Nantucket Electric Company	4,737,476	9,207,832	13,945,308	0.46%
T-186	5360E	Narragansett Electric Company	109,163,408	92,177,717	201,341,125	6.66%
T-186	5360T	Narragansett Electric Company (Transmission)	30,397,425	25,667,626	56,065,051	1.86%
T-186	5410T	New England Power (Transmission)	211,490,445	104,064,002	315,554,447	10.44%
Totals					3,021,965,714	100.00%

4.6 IT Ongoing Operational Costs (RTB):

This project will impact Service Delivery CNI IT Budget ongoing operations support costs as per the following table. These are also known as Run the Business (RTB) costs (in thousands).

all figures in \$ thousands						
INV ID:	4914				Date RTB Last Forecasted	01/29/2019
Investment Name:	EMS Lifecycle Hardware and Software Upgrade					
Project Manager:	Lynn McLaren			PDM:	Michelle McNaught	
All figures in \$ thousands	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Total
	FY 20/21	FY 21/22	FY 22/23	FY 23/24	FY 24/25	
Last Sanctioned Net Impact to RTB						
Last Sanction IS Net Impact to RTB	386.2	861.1	932.8	1,038.1	1,038.1	4,256.3
Last Sanction Business Net Impact to RTB						-
Last Sanction Total Net Impact to RTB	386.2	861.1	932.8	1,038.1	1,038.1	4,256.3
Planned/Budgeted Net Impact to RTB						
IS Investment Plan Net Impact to RTB	386.2	861.1	932.8	1,038.1	1,038.1	4,256.3
Business Budgeted Net Impact to RTB						-
Currently Forecasted Net Impact to RTB						
IS Funded Net Impact to RTB Forecasted at Go-Live	344.4	1,300.6	1,375.2	1,375.2	1,375.2	5,770.8
Business Funded Net Impact to RTB Forecasted at Go-Live	-	-	-	-	-	-
Variance to Planned/Budgeted Net Impact to RTB						
IS Investment Plan Net Impact to RTB Variance	41.8	(439.5)	(442.4)	(337.1)	(337.1)	(1,514.5)
Business Budgeted Net Impact to RTB Variance	-	-	-	-	-	

4.7 Other Appendices

N/A

Closure: US Sanction Paper

Title:	Waste Disposal Tracking	Sanction Paper #:	
Project #:	INVP 4926	Sanction Type:	Closure
Capex #:	N/A		
Operating Company:	National Grid USA Svc. Co.	Date of Request:	9/6/2019
Author:	Damiano, Lori	Sponsor(s):	Mills, Jeannette Snr VP Safety Health & Environment Snr IT BA IS Projects
Utility Service:	IT	Project Manager:	Cleary, Sarah

Executive Summary

Note: The latest sanction amount was M.
This paper is presented to close INVP 4926. The total spend was \$0.000M. The original sanctioned amount for this project was \$0.138M at +/- 10%.

Project Summary

This mandated project meets the requirements for Regulatory Mandate 40CFR Parts 239-258; 260-273. Storage and disposal of hazardous wastes or universal wastes from the company is a compliance obligation. These activities are regulated by multiple Federal, State, and local laws, including the requirements around accurate record keeping. This project was established to gather and review architecture and business requirements for the vendor Chemical Safety for use of their Environmental Management Systems (EMS) software system with a design allowing future use of this software without impacts to any changes or updates that National Grid may make to desktops employees use.

Schedule Variance Table

	Schedule Variance	
Project Grade - Ready to use Date		6/3/2019
Actual Ready to use Date		7/30/2019
Schedule Variance		0 year(s), 1 month(s), 27 day(s)

Cost Summary Table

Project Sanction Summary (\$M)	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
	Capex	0.000	0.000	0.000
	Opex	0.000	0.138	0.138

Removal	0.000	0.000	0.000
Total	0.000	0.138	0.138

Cost Variance Analysis

Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)

Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
5353	Capex			0.000
	Opex		0.138	0.138
	Removal			0.000
	Total	0.000	0.138	0.138

Project Sanction Summary (\$M)

	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Total	Capex	0.000	0.000	0.000
	Opex	0.000	0.138	0.138
	Removal	0.000	0.000	0.000
	Total	0.000	0.138	0.138

Improvements / Lessons Learned

- Negative: After delayed start up, contracts and expectations should be reviewed with vendor and refreshed as needed. Review expectations with Vendor (costs, timelines, etc).
 - Action: Review expectations with Vendor (costs, timelines, etc).
 - Stage: Start Up
 - Area: Approval
 - Root Cause: Vendor
- Positive: ARB review process provides and early view to the potential success of the solution.
 - Action: Continue with early architecture review
 - Stage: Start Up
 - Area: Communications
 - Root Cause: Vendor
- Negative: Negotiations with the vendor did not include vendor legal participation and stalled/ended vendor engagement.
 - Action: Set expectations with vendors regarding expectations for engagement.
 - Stage: Start Up
 - Area: Approval
 - Root Cause: Vendor

Closeout Activities

ACTIVITY	COMPLETED
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No

All unused material have been returned

☒ Yes ☐ No

All as-builts have been completed

☒ Yes ☐ No

All lessons learned have been entered appropriately
into the lesson learned database

☒ Yes ☐ No

Statement of Support		
Department	Individual	Responsibilities
Business Department	Willard, Charles F.	Business Representative
Business Partner (BP)	Lorkiewicz, Robert J.	Relationship Manager
Program Delivery Management (PDM)	Mcnaught, Michelle	Program Delivery Director
IT Finance	Harris, Michelle	Manager
IT Regulatory	Gill, Thomas F.	Manager
Digital Risk and Security (DR&S)	Simkin, Diana	Manager
Service Delivery	Mirizio, Mark	Principal Analyst
ARB Verification	Lyba, Svetlana	Director
Enterprise Portfolio Management	Cronin, Daniel	Analyst

Reviewers	
Function	Individual
Regulatory	Mancinelli, Lauri A.
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Smith, Amy
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego

Decisions

The US ITSC Sanctioning Committee and Executive Sponsor has reviewed and approved this paper.

Signature _____

Date _____

Premjith Singh
VP IT EPMO

Appendix

N/A

Closure Paper

Title:	Process Automation Implementation	Sanction Paper #:	USSC-18-149C
Project #:	INVP 4941 (S007828)	Sanction Type:	Closure
Operating Company:	National Grid USA Svc. Co.	Date of Request:	3/26/2019
Author:	Baseer Ahmad / Suresh Muthiravilayil	Sponsor:	John Gilbert, Global Head IS Service Delivery
Utility Service:	IT	Project Manager:	Jeffrey Dailey

1 Executive Summary

This paper is presented to close INVP 4941. The total spend was \$1.146M. The original sanctioned amount for this project was \$1.090M at +/- 10%.

2 Project Summary

This project delivered National Grid's Process Automation platform. Process Automation automates tasks & functions and improves process execution accuracy. Using the output of the related Feasibility & Analysis study, the current project delivers the environment and configures the pre-defined use cases for the following business areas: Procure to Pay, Account Maintenance and Operations, Billing, Credit & Collections and Payment Processing.

3 Variance Analysis

Cost Summary Table

Project Sanction Summary (\$M)				
Title	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Process Automation Implementation	Capex	1.062	1.017	(0.045)
	Opex	0.084	0.073	(0.011)
	Removal	0.000	0.000	0.000
	Total	1.146	1.090	(0.056)

Cost Variance Analysis

- Project cost variance is within tolerance.
- Contributors to variance:
 - Additional System Integrator scope
 - Challenges/Delays in building out new Virtual Desktop (VDI) infrastructure, including Verizon Firewall changes in support of same

3.1 Schedule Variance Table

Closure Paper

Schedule Variance	
Project Grade - Ready for Use Date	6/30/2018
Actual Ready for Use Date	9/25/2018
Schedule Variance	0 years, 2 months, 26 days

3.2 Schedule Variance Explanation

- Delay in building out National Grid's strategic cloud node (secondary location) to host a disaster recovery solution for virtual desktops used by Process Automation.
- Delay in implementation of required network changes by ecosystem partner.

4 Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)				
Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
INVP 4941 Capex: S007828	Capex	1.062	1.017	(0.045)
	Opex	0.084	0.073	(0.011)
	Removal	0.000	0.000	0.000
	Total	1.146	1.090	(0.056)

5 Improvements / Lessons Learned/Root Cause

- 2018-LL-611 Project must have clear insight into National Grid's cloud strategy / road map to take the appropriate course of action.

6 Closeout Activities

The following closeout activities have been completed..

Activity	Completed
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused materials have been returned	<input checked="" type="radio"/> Yes <input type="radio"/> No

Closure Paper

All IT Service Transition activities have been completed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All lessons learned have been entered appropriately into the IT Knowledge Management Tool (KMT) lesson learned database	<input checked="" type="radio"/> Yes <input type="radio"/> No

7 Statements of Support

7.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Department	Individual	Responsibilities
Business Department	Mike Zinsmeyer	Business Representative
Business Partner (BP)	Joel Semel	Relationship Manager
Program Delivery Management (PDM)	Jeff Dailey	Program Delivery Director
IT Finance	Michelle Harris	Manager
IT Regulatory	Dan DeMauro	Director
Digital Risk and Security (DR&S)	Peter Shattuck	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director

7.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Function	Individual
Regulatory	Harvey, Maria
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Currie, John
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego



Closure Paper

8 Decisions

I approve this paper.

Signature.....Date.....

David H. Campbell, Vice President ServCo Business Partnering, USSC Chair



US Sanction Paper

Title:	S4 Roadmap	Sanction Paper #:	
Project #:	INVP 4957 Capex: S007575	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	3/18/2019
Author / NG Representative:	Anil Garg / Ella Weisbord	Sponsor:	Alejandro Mango, VP Finance Excellence
Utility Service:	IT	Project Manager:	Samir Parikh

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of INVP4957 in the amount of \$3.015 M with a tolerance of +/- 10% Feasibility and Analysis.

This sanction amount is \$3.015 M broken down into:

\$0.000M Capex

\$3.015M Opex

\$0.000M Removal

1.2 Project Summary

This project will conduct a feasibility study to analyze National Grid's current SAP landscape and assess high level requirements for transitioning to SAP's next generation platform, S/4 HANA. This platform is built on a modern in-memory database and offers personalized user experiences through SAP Fiori. During this roadmap and technical discovery, the National Grid team, with support from PWC, will build the foundation and path forward. In addition, this project will work toward defining key improvement opportunities in areas such as Code Block redesign, Account Reconciliation improvements, Journal Entry automation of end-to-end process, and improved reporting

1.3 Summary of Projects

Project Number	Project Type (Elec only)	Project Title	Estimate Amount (\$M)
INVP 4957 Capex: S007575		S4 Roadmap	3.015
Total			3.015

1.4 Associated Projects

N/A



US Sanction Paper

1.5 Prior Sanctioning History

N/A

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
June 2020	Project Closure Sanction

1.7 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input checked="" type="radio"/> Mandatory <input type="radio"/> Policy- Driven <input type="radio"/> Justified NPV <input type="radio"/> Other	This project will support National Grid Information Technology policy to keep business critical platform under support from software provider.

1.8 Asset Management Risk Score

Asset Management Risk Score: 35

Primary Risk Score Driver: (Policy Driven Projects Only)

☒ Reliability
☐ Environment
☐ Health & Safety
☐ Not Policy Driven

1.9 Complexity Level

☐ High Complexity
☐ Medium Complexity
☐ Low Complexity
☒ N/A

Complexity Score: N/A



US Sanction Paper

1.10 Process Hazard Assessment

A Process Hazard Assessment (PHA) is required for this project:

☐ Yes ☒ No

1.11 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
IT Investment Plan FY20 - 24	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Over <input type="radio"/> Under <input checked="" type="radio"/> NA	

1.12 If cost > approved Business Plan how will this be funded?

N/A

1.13 Current Planning Horizon

\$M	Prior Yrs	Current Planning Horizon						Total
		Yr. 1 2019/20	Yr. 2 2020/21	Yr. 3 2021/22	Yr. 4 2022/23	Yr. 5 2023/24	Yr. 6 + 2024/25	
CapEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx	0.825	2.190	0.000	0.000	0.000	0.000	0.000	3.015
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.825	2.190	0.000	0.000	0.000	0.000	0.000	3.015

1.14 Key Milestones

Milestone	Target Date: (Month Year)
Start Up	December 2018
Project Sanction	March 2019
Project Closure	June 2020

US Sanction Paper**1.15 Resources, Operations and Procurement**

Resource Sourcing			
Engineering & Design Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Construction/Implementation Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Resource Delivery			
Availability of internal resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Availability of external resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Operational Impact			
Outage impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Procurement Impact			
Procurement impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green

1.16 Key Issues (include mitigation of Red or Amber Resources)

N/A

1.17 Climate Change

Contribution to National Grid's 2050 80% emissions reduction target:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative
Impact on adaptability of network for future climate change:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative

1.18 List References

N/A



US Sanction Paper

2 Decisions

I:

- (a) APPROVE this paper and the investment of \$ 3.015M and a tolerance of +/-10% for the purposes of Feasibility and Analysis
- (b) NOTE that Sameer Parikh is the Project Manager and has the approved financial delegation to undertake the activities stated in (a).

Signature.....Date.....

Premjith Singh, VP IT Tower Lead – Gas Business Partner

US Sanction Paper**3 Sanction Paper Detail**

Title:	S4 Roadmap	Sanction Paper #:	
Project #:	INVP 4957 Capex: S007575	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	3/18/2019
Author / NG Representative:	Anil Garg / Ella Weisbord	Sponsor:	Alejandro Mango, VP Finance Excellence
Utility Service:	IT	Project Manager:	Samir Parikh

3.1 *Background*

National Grid uses SAP ERP as its Backoffice platform supporting various functions, including Finance, Payroll, Human Resources and Supply Chain. SAP has designated the end of life date for the version of the platform currently deployed at National Grid. Therefore, National Grid is undertaking an effort to determine the best path forward to transition onto the next generation SAP platform, S4/HANA.

This project will conduct a feasibility study to analyze National Grid's current SAP landscape and assess high level requirements for transitioning to SAP's next generation platform, S/4 HANA. This platform is built on a modern in-memory database and offers personalized user experiences through SAP Fiori. During this roadmap and technical discovery, the National Grid team, with support from PWC, will build the foundation and path forward.

In addition, this project will work toward defining key improvement opportunities in such areas as

1. Code Block: Redesign chart of accounts to drive consistency and simplicity
2. Account Reconciliations: Determine path forward and explore new applications
3. Journal Entries: Automation of end-to-end process with limited manual entry
4. Process Automation: Identify automation opportunities to implement now and in the future, which would include automation opportunities which might exist to support National Grid's Digital Close initiative
5. Power Plan: Improve interface to SAP and reposition as sub-ledger
6. Reporting: Provide better access to data with more meaningful KPIs and business drivers

US Sanction Paper

3.2 Drivers

The main driver for this investment is National Grid's need to stay compliant with vendor (SAP) software requirements.

3.3 Project Description

This phase of the project will support the 12 work-week review in collaboration with PWC. Based on the discoveries done in this phase, the project will deliver:

- Capability analysis and target state scope
- SAP solutions and option analysis, including integration to non-SAP solution
- Instance strategy
- Roadmap and deployment sequence
- Cost, benefit and effort estimates (including review of the depreciation consideration of the current NG SAP asset)
- Stakeholder presentation(s)

3.4 Benefits Summary

The main benefits of this projects are:

- Longer term technology alignment and reuse leading to lower project cost and RTB in the future
- Supportability of the solution
- Reduced regret cost in the future

3.5 Business and Customer Issues

There are no significant business issues beyond what has been described elsewhere.

3.6 Alternatives

Alternative 1: Do nothing.

This no-cost alternative will cause significant risk. National Grid use SAP platform as main back office system and have to move to the new platform suggested by vendor by 2025 to stay in support. Doing it with internal resources will increase risk and will impact the delivery negatively.

Indicative cost: Was not assessed as the alternative was not acceptable

Rejected: Significant risk for critical application



US Sanction Paper

3.7 Safety, Environmental and Project Planning Issues

There are no significant issues beyond what has been described elsewhere.

3.8 Execution Risk Appraisal

N/A

3.9 Permitting

N/A

3.10 Investment Recovery

3.10.1 Investment Recovery and Regulatory Implications

Recovery will occur at the time of the next rate case for any operating company receiving allocations of these costs

3.10.2 Customer Impact

N/A

3.10.3 CIAC / Reimbursement

N/A

3.11 Financial Impact to National Grid

3.11.1 Cost Summary Table

Project Number	Project Title	Project Estimate Level (%)	Spend (\$M)	Prior Yrs	Current Planning Horizon						Total
					Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
INVP 4957 Capex: S007575	S4 Roadmap	Est Lvl (+/- 10%)	CapEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			OpEx	0.825	2.190	0.000	0.000	0.000	0.000	0.000	3.015
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.825	2.190	0.000	0.000	0.000	0.000	0.000	3.015



US Sanction Paper

3.11.2 Project Budget Summary Table

Project Costs per Business Plan

		Current Planning Horizon						
		Prior Yrs (Actual)	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +
\$M			2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
CapEx		0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx		0.825	2.190	0.000	0.000	0.000	0.000	0.000
Removal		0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan		0.825	2.190	0.000	0.000	0.000	0.000	0.000

Variance (Business Plan-Project Estimate)

		Current Planning Horizon						
		Prior Yrs (Actual)	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +
\$M			2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
CapEx		0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx		(0.825)	0.000	0.000	0.000	0.000	0.000	0.000
Removal		0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan		(0.825)	0.000	0.000	0.000	0.000	0.000	0.000

3.11.3 Cost Assumptions

3.11.4 Net Present Value / Cost Benefit Analysis

3.11.4.1 NPV Summary Table

N/A

3.11.4.2 NPV Assumptions and Calculations

3.11.5 Additional Impacts



US Sanction Paper

3.12 Statements of Support

3.12.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Department	Individual	Responsibilities
Business Department	William Donoghue	Business Representative
Business Partner (BP)	Joel Semel	Relationship Manager
Program Delivery Management (PDM)	Samir Parikh	Program Delivery Director
IT Finance	Michele Harris	Manager
IT Regulatory	Daniel DeMauro	Director
Digital Risk and Security (DR&S)	Elaine Wilson	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director

3.12.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Function	Individual
Regulatory	Harvey, Maria
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Currie, John
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego

US Sanction Paper

4 Appendices

4.1 Sanction Request Breakdown by Project

N/A

4.2 Project Cost Breakdown

N/A

4.3 Other Appendices

N/A

4.4 NPV Summary

N/A

4.5 Customer Outreach Plan

N/A



US Sanction Paper

4.6 Benefiting Operating Companies

Benefiting Operating Companies	Business Area	State
Niagara Mohawk Power Corp.- Electric Distr.	Electric Distribution	NY
Massachusetts Electric Company	Electric Distribution	MA
KeySpan Energy Delivery New York	Gas Distribution	NY
KeySpan Energy Delivery Long Island	Gas Distribution	NY
Boston Gas Company	Gas Distribution	MA
Narragansett Electric Company	Electric Distribution	RI
Niagara Mohawk Power Corp. - Transmission	Transmission	NY
Niagara Mohawk Power Corp. - Gas	Gas Distribution	NY
New England Power Company – Transmission	Transmission	MA, NH, RI, VT
KeySpan Generation LLC (PSA)	Generation	NY
Narragansett Gas Company	Gas Distribution	RI
Colonial Gas Company	Gas Distribution	MA
Narragansett Electric Company – Transmission	Transmission	RI
National Grid USA Parent	Parent Company	
Nantucket Electric Company	Electric Distribution	MA
NE Hydro - Trans Electric Co.	Inter Connector	MA,NH
KeySpan Energy Development Corporation	Non-Regulated	NY
KeySpan Port Jefferson Energy Center	Generation	NY
KeySpan Services Inc. Service Company	Service Company	
KeySpan Glenwood Energy Center	Generation	NY
Massachusetts Electric Company – Transmission	Transmission	MA
NG LNG LP Regulated Entity	Gas Distribution	MA, NY, RI
KeySpan Energy Corp. Service Company	Service Company	

4.7 IT Ongoing Operational Costs (RTB):

N/A



Closure Paper

Title:	Annual HR & Payroll Mandatory Service Pack Upgrade (HRSP) - FY19	Sanction Paper #:	USSC-18-292v2
Project #:	INVP 4965 Capex: S007958	Sanction Type:	Closure
Operating Company:	National Grid USA Svc. Co.	Date of Request:	Select meeting date
Author / NG Representative:	Anil Garg / Ella Weisbord	Sponsor:	Christopher McConnachie, VP Finance Services
Utility Service:	IT	Project Manager:	Samir Parikh

1 Executive Summary

This paper is presented to close INVP 4965. The total spend was \$1.126M. The original sanctioned amount for this project was \$1.377M at +/- 10%.

2 Project Summary

This project provides a funding base and governance structure that allows the Information Technology (IT) organization to effectively deliver needed updates to the US SAP application portfolio in order to comply with federal, state, and local government requirements.

3 Variance Analysis

3.1 Cost Summary Table

Project Sanction Summary (\$M)				
Title	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Annual HR & Payroll Mandatory Service Pack Upgrade (HRSP) - FY19	Capex	0.860	1.126	0.266
	Opex	0.266	0.251	(0.015)
	Removal	0.000	0.000	0.000
	Total	1.126	1.377	0.251



Closure Paper

3.2 Cost Variance Analysis

This project was delivered under budget because we chose not to implement the December HR patches and we did not encounter any post go-live performance issues as in years past.

This project budgeted \$0.036 for the analysis and implementation of the December 2018 HR patches which were released after the project go-live. Upon analysis of the notes in December it was determined that they were not required to be implemented in FY 2019 and would be implemented with the FY 2020 HRSP project.

This project also budgeted \$0.217K in risk due to past HRSP upgrade projects experiencing performance issues post go-live requiring the project to extend the Post Go Live Support (PGLS) period as well as extending resources to support identification and resolution of the issues. This project did not experience any post go-live performance issues and closed the PGLS period as planned after two weeks and therefor did not need the full risk budget.

3.3 Schedule Variance Table

Schedule Variance	
Project Grade - Ready for Use Date	12/10/2018
Actual Ready for Use Date	12/10/2018
Schedule Variance	- 0 years, 0 months, 0 days

3.4 Schedule Variance Explanation

N/A.

4 Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)				
Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
INVP 4965 Capex: S007958	Capex	0.860	1.126	0.266
	Opex	0.266	0.251	(0.015)
	Removal	0.000	0.000	0.000
	Total	1.126	1.377	0.251

Closure Paper

5 Improvements / Lessons Learned/Root Cause

- LL-2019-XXX
- LL-2019-XXX

6 Closeout Activities

The following closeout activities have been completed.

Activity	Completed
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused materials have been returned	<input checked="" type="radio"/> Yes <input type="radio"/> No
All IT Service Transition activities have been completed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All lessons learned have been entered appropriately into the IT Knowledge Management Tool (KMT) lesson learned database	<input checked="" type="radio"/> Yes <input type="radio"/> No

7 Statements of Support

7.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Department	Individual	Responsibilities
Business Department	Tom LaVeck	Business Representative
Business Partner (BP)	Joel Semel	Relationship Manager
Program Delivery Management (PDM)	Samir Parikh	Program Delivery Director
IT Finance	Michelle Harris	Manager
IT Regulatory	Dan DeMauro	Director
Digital Risk and Security (DR&S)	Elaine Wilson	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director

Closure Paper

nationalgrid

7.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Function	Individual
Regulatory	Harvey, Maria
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Currie, John
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego

Closure Paper

8 Decisions

I approve this paper.	
Signature.....	Date.....
David H. Campbell, Vice President ServCo Business Partnering, USSC Chair	

US Sanction Paper

Title:	Annual HR & Payroll Mandatory Service Pack Upgrade (HRSP) - FY19	Sanction Paper #:	USSC-18-292v2
Project #:	INVP 4965 Capex: S007958	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	11/13/2018
Author / NG Representative:	Diane Beard / Ella Weisbord	Sponsor:	Christopher McConnachie, VP Finance Services
Utility Service:	IT	Project Manager:	Samir Parikh

1 Executive Summary**1.1 Sanctioning Summary**

This paper requests sanction of project INVP4965 in the amount of \$1.377M with a tolerance of +/- 10% for the purposes of Full Implementation.

This sanction amount is \$1.377M broken down into:

\$1.126M Capex

\$0.251M Opex

\$0.000M Removal

1.2 Project Summary

This project provides a funding base and governance structure that allows the Information Technology (IT) organization to effectively deliver needed updates to the US SAP application portfolio in order to comply with federal, state, and local government requirements.

1.3 Summary of Projects

Project Number	Project Title	Estimate Amount (\$M)
INVP 4965	US SAP: Annual HR Payroll Mandatory Service Pack Upgrade FY19	1.377
Total		1.377

1.4 Associated Projects

N/A

US Sanction Paper**1.5 Prior Sanctioning History**

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Sanction Type	Potential Investment Tolerance
9/4/18	USSC	\$0.402M	\$1.377M	Sanction	10%

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
June 2019	Project Closure Sanction

1.7 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input checked="" type="radio"/> Mandatory <input type="radio"/> Policy- Driven <input type="radio"/> Justified NPV <input type="radio"/> Other	<p>This project funds a budget for the 2018/19 fiscal year that will be managed by the Project Delivery Team and Business Process Support (BPS) to ensure timely delivery of upgrade components for the HR modules which include the required tax, payroll, legal, and regulatory reporting changes throughout the year.</p>

1.8 Asset Management Risk Score

Asset Management Risk Score: 49

Primary Risk Score Driver: (Policy Driven Projects Only)

☐ Reliability
 ☐ Environment
 ☐ Health & Safety
 ☒ Not Policy Driven



US Sanction Paper

1.9 Complexity Level

☐ High Complexity ☒ Medium Complexity ☐ Low Complexity ☐ N/A

Complexity Score: 19

1.10 Process Hazard Assessment

A Process Hazard Assessment (PHA) is required for this project:

☐ Yes ☒ No

1.11 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
IS Investment Plan FY18 - 19	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Over <input type="radio"/> Under <input checked="" type="radio"/> NA	\$0.000

1.12 If cost > approved Business Plan how will this be funded?

N/A

1.13 Current Planning Horizon

\$M	Prior Yrs	Current Planning Horizon						Total
		Yr. 1 2019/20	Yr. 2 2020/21	Yr. 3 2021/22	Yr. 4 2022/23	Yr. 5 2023/24	Yr. 6 + 2024/25	
CapEx	0.000	1.126	0.000	0.000	0.000	0.000	0.000	1.126
OpEx	0.000	0.251	0.000	0.000	0.000	0.000	0.000	0.251
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.000	1.377	0.000	0.000	0.000	0.000	0.000	1.377



US Sanction Paper

1.14 Key Milestones

Milestone	Target Date: (Month Year)
Start Up	August 2018
Partial Sanction	September 2018
Begin Requirements and Design	September 2018
Project Sanction	November 2018
Begin Development and Implementation	November 2018
Move to Production / Last Go Live	March 2019
Project Closure	June 2019

1.15 Resources, Operations and Procurement

Resource Sourcing			
Engineering & Design Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Construction/Implementation Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Resource Delivery			
Availability of internal resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Availability of external resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Operational Impact			
Outage impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Procurement Impact			
Procurement impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green

1.16 Key Issues (include mitigation of Red or Amber Resources)

N/A

**US Sanction Paper****1.17 Climate Change**

Contribution to National Grid's 2050 80% emissions reduction target:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative
Impact on adaptability of network for future climate change:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative

1.18 List References

N/A



US Sanction Paper

2 Decisions

I:

(a) APPROVE this paper and the investment of \$1.377M and a tolerance of +/-10% for the purposes of Development and Implementation.

(c) NOTE that Samir Parikh is the Project Manager and has the approved financial delegation.

Signature.....Date.....
David H. Campbell, Vice President ServCo Business Partnering, USSC Chair

US Sanction Paper**3 Sanction Paper Detail**

Title:	Annual HR & Payroll Mandatory Service Pack Upgrade (HRSP) - FY19	Sanction Paper #:	USSC-18-292v2
Project #:	INVP 4965 Capex: S007575	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	11/13/2018
Author / NG Representative:	Diane Beard / Ella Weisbord	Sponsor:	Christopher McConnachie, VP Finance Services
Utility Service:	IT	Project Manager:	Samir Parikh

3.1 *Background*

SAP releases an annual support pack update for components of its HR modules.

Required updates include the following:

- Tax changes
- Payroll modifications
- Legal and regulatory reporting changes
- Considerations required to produce year end employee wage statements (W-2s)
- Tax table changes for correctly processing payroll and required earnings withholdings
- Revised tax withholding tables
- New annual maximum withholding requirements
- All associated legal and regulatory compliance or reporting considerations for employee and company labor governmental reporting

The annual HR support packs contain updates for the close out Quarterly Employer Tax Reporting and current calendar year reporting cycle and for staging the requisite changes for the subsequent calendar year reporting cycle.

These are mandatory annual changes requested by federal and state agencies, such as the Internal Revenue Services (IRS) and various state Departments of Finance, as well as different municipalities which must be applied to the SAP core solution in order to properly reflect employee wages, employee and company withholdings, legal requirements and to comply with federal and state regulatory reporting.

National Grid applies the service pack updates on an annual basis. The requirement analysis will assure the alignment with other IT projects and business programs, such



US Sanction Paper

as data center migration, and define the approach to prepare system updates that will occur in December.

3.2 Drivers

The primary driver is to comply with mandatory federal and state changes to laws and regulations in order to properly reflect employee wages, employee and company tax withholdings, legal requirements and to comply with regulatory reporting.

3.3 Project Description

The annual HR SAP Support packs increase system reliability by applying upgrade service packs provided by SAP on a regular basis following the vendor recommended schedule. The project will ensure the upgrades are applied to the National Grid US SAP environment by following the IT delivery process and best practices, and overseeing necessary testing (modular and integration) as well as providing overall governance for the upgrades.

3.4 Benefits Summary

The project is intended to implement and comply with mandatory federal and state regulatory and legal changes. For example, new tax tables and any new changes to employer tax reporting are achieved through applying these HR support packs. The anticipated benefits of upgrading from current patch level to the new patch level or applying the HR support pack are listed below.

- Produce weekly, monthly and special payroll runs
- Ensure correct federal and state withholdings and legal reporting requirements
- Provide a more stable and reliable core SAP solution
- Reduce need for incident resolution and associated patches
- Provide an opportunity to eliminate and reduce custom code for changes
- Allow for faster SAP vendor resolution times for production incidents/issues.

3.5 Business and Customer Issues

There are no significant business and customer issues beyond what has been described elsewhere in this paper

US Sanction Paper**3.6 Alternatives****Alternative 1: Defer project / Do Nothing**

This option is not viable as the upgrades are mandatory to comply with changes to federal and state laws and regulations.

3.7 Safety, Environmental and Project Planning Issues

There are no significant issues beyond what has been described in this paper.

3.8 Execution Risk Appraisal

Number	Detailed Description of Risk / Opportunity	Probability	Impact		Score		Strategy	Pre-Trigger Mitigation Plan	Residual Risk	Post Trigger Mitigation Plan
			Cost	Schedule	Cost	Schedule				
1	Delivery of DEV environment from FIT to support mock 1 cutover is currently planned for September 24th, leaves only 4 days to load transports, copy over data from T-Systems DEV, and perform validation testing.	3	5	5	15	15	Mitigate	Working with BASIS team to identify a back-up plan for environments.		
2	We do not have a contingency plan for QA1 or QA 2 environments, any delay in the delivery of these environments from FIT will impact the go-live date.	3	4	4	12	12	Mitigate	Working with BASIS team to identify a back-up plan for environments.		
3	The data for QA1 environments will be from a July snapshot, there is a potential that QA2 environments will have the same data which would not include GBE and YouConnect.	3	3	3	9	9	Avoid	Working to have refresh completed in time so that new data will be available for regression testing.		
4	December releases of SAP_HR patches D3-D5 and EA_HR patches 84-85 need to be analyzed to determine if they are needed for December production cutover.	3	3	3	9	9	Accept			

3.9 Permitting

N/A

3.10 Investment Recovery**3.10.1 Investment Recovery and Regulatory Implications**

Recovery will occur at the time of the next rate case for any operating company receiving allocations of these costs.

3.10.2 Customer Impact

N/A



US Sanction Paper

3.10.3 CIAC / Reimbursement

N/A

3.11 Financial Impact to National Grid

3.11.1 Cost Summary Table

Project Number	Project Title	Project Estimate Level (%)	Spend (\$M)	Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	Total
					2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	
INVP 4965	US SAP: Annual HR Payroll Mandatory Service Pack Upgrade FY19	+/- 10%	CapEx	0.000	1.126	0.000	0.000	0.000	0.000	0.000	1.126
			OpEx	0.000	0.251	0.000	0.000	0.000	0.000	0.251	
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
			Total	0.000	1.377	0.000	0.000	0.000	0.000	1.377	
Total Project Sanction			CapEx	0.000	1.126	0.000	0.000	0.000	0.000	0.000	1.126
			OpEx	0.000	0.251	0.000	0.000	0.000	0.000	0.000	0.251
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.000	1.377	0.000	0.000	0.000	0.000	0.000	1.377

3.11.1 Project Budget Summary Table

3.11.2

Project Costs per Business Plan

		Current Planning Horizon						
		Prior Yrs (Actual)	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +
\$M			1.126	2020/21	2021/22	2022/23	2023/24	2024/25
CapEx	0.000	1.126	0.000	0.000	0.000	0.000	0.000	0.000
OpEx	0.000	0.251	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	1.377	0.000	0.000	0.000	0.000	0.000	0.000

Variance (Business Plan-Project Estimate)

		Current Planning Horizon						
		Prior Yrs (Actual)	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +
\$M			2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
CapEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

US Sanction Paper**3.11.3 Cost Assumptions****3.11.4 Net Present Value / Cost Benefit Analysis****3.11.4.1 NPV Summary Table**

N/A

3.11.4.2 NPV Assumptions and Calculations**3.11.5 Additional Impacts**

None

3.12 Statements of Support**3.12.1 Supporters**

The supporters listed have aligned their part of the business to support the project.

Department	Individual	Responsibilities
Business Department	Tom LaVeck	Business Representative
Program Delivery Management (PDM)	Deborah Rollins	Head of PDM
Business Partner (BP)	Joel Semel	Relationship Manager
Program Delivery Management (PDM)	Samir Parikh	Program Delivery Director
IT Finance	Michelle Harris	Manager
IT Regulatory	Dan DeMauro	Director
Digital Risk and Security (DR&S)	Elaine Wilson	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director

US Sanction Paper**3.12.2 Reviewers**

The reviewers have provided feedback on the content/language of the paper.

Function	Individual
Regulatory	Harvey, Maria
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Currie, John
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego

4 Appendices**4.1 Sanction Request Breakdown by Project**

N/A



US Sanction Paper

4.2 Other Appendices

4.2.1 Project Cost Breakdown

Project Cost Breakdown \$ (millions)					
Cost Category	sub-category	Value of Work to Date (VOWD)	Forecast to Complete (FTC)	Forecast At Completion (FAC=VOWD+FTC)	Name of Firm(s) providing resources
Personnel	NG Resources	0.035	0.216	0.251	
	SDC Time & Materials	0.006	0.007	0.013	IBM
			-	-	WiPro
			-	-	DXC
			-	-	Verizon
	SDC Fixed-Price		-	-	IBM
			0.659	0.659	WiPro
			-	-	DXC
			-	-	Verizon
	All other personnel	0.081	0.032	0.113	
	TOTAL Personnel Costs	0.122	0.914	1.035	
Hardware	Purchase		-	-	
	Lease		-	-	
Software			-	-	
Risk Margin			0.116	0.116	
AFUDC		0.000	0.023	0.023	
Other			0.202	0.202	
TOTAL Costs		0.122	1.255	1.377	

US Sanction Paper**4.2.2 Benefiting Operating Companies**

Company Description
Niagara Mohawk Power Corp.- Electric Distr.
Niagara Mohawk Power Corp. - Gas
Niagara Mohawk Power Corp. - Transmission
KeySpan Energy Delivery New York
KeySpan Energy Delivery Long Island
Massachusetts Electric Company
Nantucket Electric Company
Boston Gas Company
Colonial Gas Company
Narragansett Electric Company
Narragansett Gas Company
KeySpan LNG LP Regulated Entity
KeySpan Generation LLC (PSA)
Transgas Inc

4.2.3 IS Ongoing Operational Costs (RTB):

There are no RTB cost impacts as a result of this project.

4.3 NPV Summary (if applicable)


N/A

4.4 Customer Outreach Plan

N/A

9/11/2019

eSanction Form - USSC - INVP 4965 Annual HRSP Upgrade - FY19 - Closure

			
Closure: US Sanction Paper			
Title:	Annual HR & Payroll Mandatory SerSanction Paper #: USSC-18-292 C		
Project #:	INVP 4965	Sanction Type:	Closure
Capex #:	S007958		
Operating Company:	National Grid USA Svc. Co.	Date of Request:	9/17/2019
Author:	Garg, Anil Weisbord, Ella	Sponsor(s):	McConnachie, Chris Vice President, Finance Services, F Contractor
Utility Service:	IT	Project Manager:	Parikh, Samir

Executive Summary

Note: The latest sanction amount was M.
This paper is presented to close INVP 4965. The total spend was \$1.376M. The original sanctioned amount for this project was \$1.377M at +/- 10%.

Project Summary

This project provided a funding base and governance structure for the Information Technology (IT) organization to effectively deliver needed updates to the US SAP application portfolio to comply with federal, state, and local government requirements. This project delivered required updates to employee paychecks, Tax Reporter Form layout, Benefit limits, process changes and underlying program logic changes.

Schedule Variance Table

Schedule Variance	
Project Grade - Ready to use Date	12/10/2018
Actual Ready to use Date	12/10/2018
Schedule Variance	0 year(s), 0 month(s), 0 day(s)

Cost Summary Table

Project Sanction Summary (\$M)				
	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
	Capex	1.092	1.126	0.034
	Opex	0.284	0.251	(0.033)
	Removal	0.000	0.000	0.000
	Total	1.376	1.377	0.001

Cost Variance Analysis

N/A

Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)				
Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
4965	Capex	1.092	1.126	0.034
	Opex	0.284	0.251	(0.033)
	Removal			0.000
	Total	1.376	1.377	0.001
Project Sanction Summary (\$M)				
	Breakdown	Total Actual	Original Project	Variance

9/11/2019

eSanction Form - USSC - INVP 4965 Annual HRSP Upgrade - FY19 - Closure

		Spend	Sanction Approval	(Over) / Under
Total	Capex	1.092	1.126	0.034
	Opex	0.284	0.251	(0.033)
	Removal	0.000	0.000	0.000
	Total	1.376	1.377	0.001

Improvements / Lessons Learned

2019-LL-738 : Review all dependencies for patch upgrades
2019-LL-739 : Move critical payroll patches into production earlier in the calendar year

Closeout Activities

ACTIVITY	COMPLETED
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused material have been returned	<input checked="" type="radio"/> Yes <input type="radio"/> No
All as-builts have been completed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All lessons learned have been entered appropriately into the lesson learned database	<input checked="" type="radio"/> Yes <input type="radio"/> No

Statement of Support

Department	Individual	Responsibilities
Business Department	LaVeck, Thomas	Business Representative
Business Partner (BP)	Semel, Joel	Relationship Manager
Program Delivery Management (PDM)	Parikh, Samir	Program Delivery Director
IT Finance	Harris, Michelle	Manager
IT Regulatory	DeMauro, Daniel J.	Director
Digital Risk and Security (DR&S)	Wilson, Elaine	Director
Service Delivery	Mirizio, Mark	Principal Analyst
ARB Verification	Clinchot, Joseph J.	Director
Enterprise Portfolio Management	Cronin, Daniel	Analyst

Reviewers

Function	Individual
Regulatory	Mancinelli, Lauri A.
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Smith, Amy
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego

9/11/2019

eSanction Form - USSC - INVP 4965 Annual HRSP Upgrade - FY19 - Closure

Decisions

I approve this paper.

Signature _____

Date _____

Christine McClure, Vice President, Finance Business Partner Service Company, USSC Chair

9/11/2019

eSanction Form - USSC - INVP 4965 Annual HRSP Upgrade - FY19 - Closure

Appendix
N/A



US Sanction Paper

Title:	US SAP: Infrastructure Landscape- FY19	Sanction Paper #:	USSC-18-213v2
Project #:	INVP 4970 Capex: S007865	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	1/29/2019
Author / NG Representative:	Anil Garg / Ella Weisbord	Sponsor:	Narayan Devireddy, VP Solution & Del
Utility Service:	IT	Project Manager:	Samir Parikh

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of INVP 4970 in the amount of \$4.700M with a tolerance of +/- 10% for the purposes of Full Implementation.

This sanction amount is \$4.700M broken down into:
\$3.600M Capex
\$1.100M Opex
\$0.000M Removal

1.2 Project Summary

This project will create / refresh non-production environments used for project development in support of initiatives pertaining to the Systems, Applications and Products (SAP) portfolio.

1.3 Summary of Projects

Project Number	Project Title	Estimate Amount (\$M)
INVP 4970 / Capex: S007865	US SAP: Infrastructure Landscape FY19	4.700
Total		4.700



US Sanction Paper

1.4 Associated Projects

Project Number	Project Title
INVP 4144	YouConnect / HRIS Simplification Program
INVP 4572	Gas Business Enablement
INVP 4662 Capex: S007732	Concur Expenses
INVP 4779 Capex: S007730	Time Entry and Approval Mobility Enhancements
INVP 4952	Drumbeat BPC Planning
INVP 4563 Capex: S007900	US SAP: FERC on HANA (FOH) Upgrade
INVP 4965 Capex: S007958	Annual HR & Payroll Mandatory Service Pack Upgrade (HRSP) - FY19
INVP 5360 CapEx: S008007	Powerplan Lease upgrade

1.5 Prior Sanctioning History

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Sanction Type	Potential Investment Tolerance
5/29/18	USSC	\$1.476M	\$4.115M	Partial	+/-25%

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
September 2019	Project Closure Sanction

1.7 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input checked="" type="radio"/> Mandatory <input type="radio"/> Policy- Driven <input type="radio"/> Justified NPV <input type="radio"/> Other	This project will set the background for all projects (mandatory and policy driven) within portfolio.



US Sanction Paper

1.8 Asset Management Risk Score

Asset Management Risk Score: 44

Primary Risk Score Driver: (Policy Driven Projects Only)

☐ Reliability ☐ Environment ☐ Health & Safety ☒ Not Policy Driven

1.9 Complexity Level

☐ High Complexity ☐ Medium Complexity ☐ Low Complexity ☒ N/A

Complexity Score: N/A

1.10 Process Hazard Assessment

A Process Hazard Assessment (PHA) is required for this project:

☐ Yes ☒ No

1.11 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
IS Investment Plan FY19 - 23	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Over <input checked="" type="radio"/> Under <input type="radio"/> NA	0.215M

1.12 If cost > approved Business Plan how will this be funded?

N/A



US Sanction Paper

1.13 Current Planning Horizon

\$M	Prior Yrs	Current Planning Horizon						
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	Total
		2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	
CapEx	0.000	3.600	0.000	0.000	0.000	0.000	0.000	3.600
OpEx	0.000	1.100	0.000	0.000	0.000	0.000	0.000	1.100
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.000	4.700	0.000	0.000	0.000	0.000	0.000	4.700

1.14 Key Milestones

Milestone	Target Date: (Month Year)
Start Up	March 2018
Partial Sanction	May 2018
Begin Requirements and Design	May 2018
Project Sanction	January 2019
Begin Development and Implementation	January 2019
Move to Production / Last Go Live	March 2019
Project Closure	September 2019

1.15 Resources, Operations and Procurement

Resource Sourcing			
Engineering & Design Resources to be provided	<input checked="" type="checkbox"/> Internal	<input type="checkbox"/> Contractor	
Construction/Implementation Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Resource Delivery			
Availability of internal resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Availability of external resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Operational Impact			
Outage impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Procurement Impact			
Procurement impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green

**US Sanction Paper****1.16 Key Issues (include mitigation of Red or Amber Resources)**

N/A

1.17 Climate Change

Contribution to National Grid's 2050 80% emissions reduction target:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative
Impact on adaptability of network for future climate change:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative

1.18 List References

N/A



US Sanction Paper

2 Decisions

I:

- (a) APPROVE this paper and the investment of \$4.700M and a tolerance of +/-10% for the purposes of Full Implementation.
- (b) NOTE that Samir Parikh is the Project Manager and has the approved financial delegation.

Signature.....Date.....

David H. Campbell, Vice President ServCo Business Partnering, USSC Chair



US Sanction Paper

3 Sanction Paper Detail

Title:	US SAP: Infrastructure Landscape – FY19	Sanction Paper #:	USSC-18-213v2
Project #:	INVP 4970 Capex: S007865	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	1/29/2019
Author / NG Representative:	Anil Garg / Ella Weisbord	Sponsor:	Narayan Devireddy, VP Solution & Del
Utility Service:	IT	Project Manager:	Samir Parikh

3.1 **Background**

Obtaining, setting and configuring project environments is a critical path task for SAP related projects and initiatives. These activities can be time consuming and add to costs. To improve IT project implementation schedules, National Grid Information Services introduced a new process in Fiscal Year (FY) 18 to provide annual funding in the beginning of each fiscal year to set and configure a set of project environments to support all initiatives within the SAP portfolio for that fiscal year.

3.2 **Drivers**

The primary driver is to improve IT project implementation schedules by creating a landscape to support all projects and initiatives within the SAP Portfolio.

3.3 **Project Description**

As part of this project, the following activities will be implemented:

- Complete design assessment to determine a permanent set of critical SAP project environments that will require further extension

3.4 **Benefits Summary**

This project is intended to support mandated projects by:

- Reducing the lead time to start projects and initiatives within the portfolio
- Increasing accuracy of cost estimates
- Alleviating project startup bottlenecks
- Increasing reliability for SAP related project delivery
- Reducing one-time capex startup costs associated with standing up new environments for each project



US Sanction Paper

3.5 *Business and Customer Issues*

There are no significant business issues beyond what has been described in this paper.

3.6 *Alternatives*

Alternative 1: Defer project / Do Nothing

This option will not address the business need for project environments to efficiently support initiatives in the SAP portfolio.

Alternative 2: Address every SAP portfolio project needs individually

This “unbundled” option, which was used in the past, will negatively impact each project within portfolio by increasing the lead time to start each initiative, add cost and complexity for portfolio management and overall delivery cycle.

3.7 *Safety, Environmental and Project Planning Issues*

There are no significant issues beyond what has been described in this paper.

3.8 *Execution Risk Appraisal*

N/A

3.9 *Permitting*

N/A

3.10 *Investment Recovery*

3.10.1 *Investment Recovery and Regulatory Implications*

Recovery will occur at the time of the next rate case for any operating company receiving allocations of these costs.

3.10.2 *Customer Impact*

N/A

3.10.3 *CIAC / Reimbursement*

N/A



US Sanction Paper

3.11 Financial Impact to National Grid

3.11.1 Cost Summary Table

					Current Planning Horizon							
Project Number	Project Title	Project Estimate Level (%)	Spend (\$M)	Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	Total	
					2018/19	2019/20	2020/21	2021/22	2022/23	2023/24		
INVP 4970 / Capex: S007865	US SAP: Infrastructure Landscape FY19	+/- 10%	CapEx	0.000	3.600	0.000	0.000	0.000	0.000	0.000	0.000	3.600
			OpEx	0.000	1.100	0.000	0.000	0.000	0.000	0.000	1.100	
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
			Total	0.000	4.700	0.000	0.000	0.000	0.000	0.000	4.700	
Total Project Sanction			CapEx	0.000	3.600	0.000	0.000	0.000	0.000	0.000	3.600	
			OpEx	0.000	1.100	0.000	0.000	0.000	0.000	0.000	1.100	
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
			Total	0.000	4.700	0.000	0.000	0.000	0.000	0.000	4.700	

3.11.2 Project Budget Summary Table

Project Costs Per Business Plan

\$M	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
CapEx	0.000	3.682	0.000	0.000	0.000	0.000	0.000	3.682
OpEx	0.000	1.233	0.000	0.000	0.000	0.000	0.000	1.233
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	4.915	0.000	0.000	0.000	0.000	0.000	4.915

Variance (Business Plan-Project Estimate)

\$M	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
CapEx	0.000	0.082	0.000	0.000	0.000	0.000	0.000	0.082
OpEx	0.000	0.133	0.000	0.000	0.000	0.000	0.000	0.133
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.215	0.000	0.000	0.000	0.000	0.000	0.215

3.11.3 Cost Assumptions

This estimate was developed using standard IT estimating methodology and was determined based upon historical monthly hosting rates for a pre-defined set of core projects. The accuracy level of the estimate for each project is identified in table 3.11.1.



US Sanction Paper

3.11.4 Net Present Value / Cost Benefit Analysis

3.11.4.1 NPV Summary Table

This is not an NPV project.

3.11.4.2 NPV Assumptions and Calculations

This is not an NPV project.

3.11.5 Additional Impacts

None

3.12 Statements of Support

3.12.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Department	Individual	Responsibilities
Business Department	Jason Gramas	Business Representative
Business Partner (BP)	Joel Semel	Relationship Manager
Program Delivery Management (PDM)	Samir Parikh	Program Delivery Director
IT Finance	Michelle Harris	Manager
IT Regulatory	Daniel DeMauro	Director
Digital Risk and Security (DR&S)	Peter Shattuck	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director

3.12.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Function	Individual
Regulatory	Harvey, Maria
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Currie, John
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego



US Sanction Paper

4 Appendices

4.1 Sanction Request Breakdown by Project

N/A

4.1 Other Appendices

4.1.1 Project Cost Breakdown

Project Cost Breakdown \$ (millions)					
Cost Category	sub-category	Value of Work to Date (VOWD)	Forecast to Complete (FTC)	Forecast At Completion (FAC=VOWD+FTC)	Name of Firm(s) providing resources
Personnel	NG Resources		-	-	
	SDC Time & Materials		-	-	IBM
			-	-	WiPro
			-	-	DXC
			-	-	Verizon
	SDC Fixed-Price		-	-	IBM
			-	-	WiPro
			-	-	DXC
			-	-	Verizon
	All other personnel		-	-	
	TOTAL Personnel Costs	-	-	-	
Hardware	Purchase		-	-	
	Lease		-	-	
Software			-	-	
Risk Margin			0.116	0.116	
AFUDC			0.056	0.056	
Other		2.974	1.553	4.527	T-Systems, HEC
TOTAL Costs		2.974	1.726	4.700	



US Sanction Paper

4.1.2 Benefiting Operating Companies

Benefiting Operating Companies	Business Area	State
Niagara Mohawk Power Corp.- Electric Distr.	Electric Distribution	NY
Massachusetts Electric Company	Electric Distribution	MA
KeySpan Energy Delivery New York	Gas Distribution	NY
KeySpan Energy Delivery Long Island	Gas Distribution	NY
Boston Gas Company	Gas Distribution	MA
Narragansett Electric Company	Electric Distribution	RI
Niagara Mohawk Power Corp. - Transmission	Transmission	NY
Niagara Mohawk Power Corp. - Gas	Gas Distribution	NY
New England Power Company – Transmission	Transmission	MA, NH, RI, VT
KeySpan Generation LLC (PSA)	Generation	NY
Narragansett Gas Company	Gas Distribution	RI
Colonial Gas Company	Gas Distribution	MA
Narragansett Electric Company – Transmission	Transmission	RI
National Grid USA Parent	Parent Company	
Nantucket Electric Company	Electric Distribution	MA
NE Hydro - Trans Electric Co.	Inter Connector	MA,NH
KeySpan Energy Development Corporation	Non-Regulated	NY
KeySpan Port Jefferson Energy Center	Generation	NY
New England Hydro - Trans Corp.	Inter Connector	MA, NH
KeySpan Services Inc. Service Company	Service Company	
KeySpan Glenwood Energy Center	Generation	NY
Massachusetts Electric Company – Transmission	Transmission	MA
NG LNG LP Regulated Entity	Gas Distribution	MA, NY, RI
Transgas Inc	Non-Regulated	NY
Keyspan Energy Trading Services	Other	NY
KeySpan Energy Corp. Service Company	Service Company	
New England Electric Trans Corp	Inter Connector	MA
New England Electric Trans Corp	InterConnector	MA

Closure Template

Title:	Complex Capital Delivery Phase 1	Sanction Paper #:	
Project #:	INVP 4972	Sanction Type:	Closure
Operating Company:	National Grid USA Svc. Co.	Date of Request:	9/21/2018
Author:	Michael Cowan	Sponsor:	Cedric Williams, VP Proj Mgmt & Complex Construction Gas
Utility Service:	IS	Project Manager:	Michael Cowan

1 Executive Summary

This paper is presented to close INVP 4972 – Complex Capital Delivery Phase 1. The total spend was \$0.864M. The original sanctioned amount for this project was \$0.954M at +/- 10% (project grade).

2 Project Summary

Improving National Grid's ability to deliver major capital Gas and Electric projects was a key element of the company's Shaping Our Future strategy. National Grid has reviewed its' capital project delivery processes and found a number of improvement opportunities that it believes will drive a step change in core performance.

The following were delivered across four workstreams:

Contract Management Work Stream:

- Evaluation of National Grid currently owned Contract Management solutions & software selection
- Creation of High Level Solution Architecture Design
- Creation of High Level Implementation plan
- Estimating Work Stream:
- Infrastructure remediation analysis and targeted solution remediation for the Success Enterprise tool

Enterprise Tool

- High Level requirements documentation for bringing Gas LoB to the existing Success Enterprise tool, currently used by Electric LoB
- Creation of High Level Solution Architecture Design
- Creation of High Level Implementation plan

Reporting & Analytics Work Stream:

- Creation of High Level Implementation plan for the National Grid Enterprise Reporting & Analytics platform Tableau capabilities
- Building Data Visualization Dashboard (s)

Risk Management Work Stream:

Closure Template

- Piloting of the @Risk software
- Creation of High Level Solution Architecture Design
- Creation of High Level Implementation plan

Work to implement the remaining agreed upon solutions will be delivered under INVP4771.

3 Variance Analysis

3.1 Cost Summary Table

Project Sanction Summary (\$M)				
Title	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Complex Capital Delivery Phase 1	Capex	0.453	0.471	0.018
	Opex	0.411	0.483	0.072
	Removal	0.000	0.000	0.000
	Total	0.864	0.954	0.090

3.2 Cost Variance Analysis

The variance is within 10%. The underspend in the actual vs. sanctioned spend is primarily due to the vendor, Cleartelligence, who worked on the Reporting and Analytics work stream, costing less and working faster than what was estimated.

Schedule Variance Table

Schedule Variance	
Project Grade - Ready for Use Date	1/31/2018
Actual Ready for Use Date	1/8/2018
Schedule Variance	- 0 years, 0 months, 23 days

Closure Template

4 Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)				
Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
4972	Capex	0.453	0.471	0.018
	Opex	0.411	0.483	0.072
	Removal	0.000	0.000	0.000
	Total	0.864	0.954	0.090

Actual Spending (\$M) vs. Sanction (\$M)				
	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Total	Capex	0.453	0.471	0.018
	Opex	0.411	0.483	0.072
	Removal	0.000	0.000	0.000
	Total	0.864	0.954	0.090

5 Improvements / Lessons Learned/Root Cause

		Lesson Learned	Recommended Action
1	2018-LL-551 - Communication	Consistent & abundant communication with the stakeholders and implementation team kept the project moving briskly and quality of the deliverables high	Constant communication with all members of the project team cannot be over-emphasized
2	2018-LL-552 - Escalation	Understanding & properly applying the escalation process helped the implementation team meet its' goals and minimized costly delays	Insure all project team members understand the importance of the escalation process and are encouraged to identify potential bottlenecks before they become issues

6 Closeout Activities

The following closeout activities have been completed.

Closure Template

Activity	Completed
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused materials have been returned	<input checked="" type="radio"/> Yes <input type="radio"/> No
All as-builts have been completed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All lessons learned have been entered appropriately into the lesson learned database	<input checked="" type="radio"/> Yes <input type="radio"/> No

7 Statements of Support**7.1 Supporters**

The supporters listed have aligned their part of the business to support the project.

Department	Individual	Responsibilities
Business Department	Cedric Williams	Business Representative
PDM	Deborah Rollins	Head of PDM
BRM	Richard Sheer	Relationship Manager
PDM	Sally Seltzer	Program Delivery Director
IS Finance	Michelle Harris	Manager
IS Regulatory	Tom Gill	Manager
DR&S	Elaine Wilson	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Sveltana Lyba	Director

7.2 Reviewers

N/A



Closure Template

8 Decisions

The US ISSC Sanctioning Committee and Executive Sponsor has reviewed and approved this paper.

Signature.....Date.....

Premjith Singh

VP IS Tower Lead, Ops & Network



US Sanction Paper

Title:	Cloud Orchestration	Sanction Paper #:	
Project #:	INVP 4981	Sanction Type:	Partial Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	10/25/2018
Author:	Aravind Lochan / Andrew Yee	Sponsor:	Steve Maxwell, Global Head of Cloud & Hosting Technologies
Utility Service:	IT	Project Manager:	John Braziel / Dave McCune

1 Executive Summary

1.1 **Sanctioning Summary**

This paper requests partial sanction of INVP 4981 in the amount of \$0.232M with a tolerance of +/- 10% for the purposes of requirements and design.

This sanction amount is \$0.232M broken down into:

\$0.040M Capex

\$0.192M Opex

\$0.000M Removal

NOTE the potential investment of \$0.906M with a tolerance of +/- 25%, contingent upon submittal and approval of a Project Sanction paper following completion of requirements and design activities.

1.2 **Project Summary**

The scope of this project is to build a National Grid Cloud Orchestration Engine using the ServiceNow tool.

Currently in the US National Grid's cloud service provisioning is not automated. Implementing a cloud orchestration engine is a way to manage, co-ordinate, and provision all the components of a cloud platform automatically via ServiceNow platform.

The Cloud orchestration engine will create templates to convert the interconnected processes into a single workflow. The processes will be integrated to the new environment workflows to achieve a single API (Application Platform Interface) trigger from ServiceNow tool. Currently, provisioning of cloud services is manual and time consuming. This will be simplified by the cloud orchestration engine.

The project scope includes:



US Sanction Paper

- Create new service request catalogue items in National Grid's ServiceNow tool to initiate a cloud service request
- Analysis of ServiceNow tool to integrate with cloud service provider (Microsoft Azure)
- Build cloud orchestration engine by creating API's (Application Programming Interface) with "Cloud Management" module in ServiceNow tool.
- Configuration of cloud orchestration engine with cloud service provider (Microsoft Azure)
- Validation of cloud orchestration engine

1.3 *Summary of Projects*

Project Number	Project Title	Estimate Amount (\$M)
INVP 4981	Cloud Orchestration	0.906
Total		0.906

1.4 *Associated Projects*

N/A

1.5 *Prior Sanctioning History*

N/A

1.6 *Next Planned Sanction Review*

Date (Month/Year)	Purpose of Sanction Review
February 2019	Project Sanction

1.7 *Category*

US Sanction Paper

Category	Reference to Mandate, Policy, NPV, or Other
<input type="radio"/> Mandatory <input type="radio"/> Policy- Driven <input type="radio"/> Justified NPV <input checked="" type="radio"/> Other	Cloud Orchestration will provide the ability to quickly stand up infrastructure. This investment will be reliable to provision cloud services automatically via ServiceNow platform.

1.8 Asset Management Risk ScoreAsset Management Risk Score: 34**Primary Risk Score Driver:** (Policy Driven Projects Only)
☒ Reliability
 ☐ Environment
 ☐ Health & Safety
 ☐ Not Policy Driven
1.9 Complexity Level
☐ High Complexity
 ☒ Medium Complexity
 ☐ Low Complexity
 ☐ N/A
Complexity Score: 19**1.10 Process Hazard Assessment**

A Process Hazard Assessment (PHA) is required for this project:

☐ Yes
 ☒ No

**US Sanction Paper****1.11 Business Plan**

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
IS Investment Plan FY19 - 23	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Over <input checked="" type="radio"/> Under <input type="radio"/> NA	\$0.194M

1.12 If cost > approved Business Plan how will this be funded?

N/A

1.13 Current Planning Horizon

\$M	Prior Yrs	Current Planning Horizon						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
		2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	
CapEx	0.000	0.130	0.389	0.000	0.000	0.000	0.000	0.518
OpEx	0.000	0.193	0.194	0.000	0.000	0.000	0.000	0.388
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.000	0.323	0.583	0.000	0.000	0.000	0.000	0.906

1.14 Key Milestones

Milestone	Target Date: (Month Year)
Start Up	June 2018
Partial Sanction	October 2018
Begin Requirements and Design	October 2018
Project Sanction	February 2019
Begin Development and Implementation	February 2019
Move to Production / Last Go Live	November 2019
Project Closure	November 2019

US Sanction Paper**1.15 Resources, Operations and Procurement**

Resource Sourcing			
Engineering & Design Resources to be provided	<input checked="" type="checkbox"/> Internal	<input type="checkbox"/> Contractor	
Construction/Implementation Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Resource Delivery			
Availability of internal resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Availability of external resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Operational Impact			
Outage impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Procurement Impact			
Procurement impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green

1.16 Key Issues (include mitigation of Red or Amber Resources)

N/A

1.17 Climate Change

Contribution to National Grid's 2050 80% emissions reduction target:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative
Impact on adaptability of network for future climate change:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative

1.18 List References

N/A



US Sanction Paper

2 Decisions

I:

- (a) APPROVE this paper and the investment of \$0.232M and a tolerance of +/-10% for the purposes of Requirements and Design
- (b) NOTED the potential investment \$ 0.906M and a tolerance of +/- 25%, contingent upon submittal and approval of a Project Sanction paper following completion of requirements and design.
- (c) NOTED that John Braziel / David McCune has approved financial deligation to undertake the activities stated in (a).

Signature.....Date.....

Premjith Singh

VP IS Tower Lead, Ops & Network

US Sanction Paper**3 Sanction Paper Detail**

Title:	Cloud Orchestration	Sanction Paper #:	
Project #:	INVP 4981 Capex:	Sanction Type:	Partial Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	10/25/2018
Author:	Aravind Lochan / Andrew Yee	Sponsor:	Steve Maxwell, Global Head of Cloud & Hosting Technologies
Utility Service:	IT	Project Manager:	John Braziel / Dave McCune

3.1 *Background*

National Grid uses Microsoft Azure cloud services for building, testing, deploying, and managing applications and services through a global network of Microsoft-managed data centers.

This project will use ServiceNow tool as a platform to build the cloud orchestration engine which automates National Grid's internal approval process and eliminates the potential errors in provisioning and scaling of Microsoft Azure cloud services, ultimately resulting in a consolidated process workflows between ServiceNow and Microsoft Azure cloud services.

3.2 *Drivers*

Cloud orchestration will provide the ability to quickly stand up infrastructure services. This project will improve efficiency of hosting and provisioning time though cloud hosting.

3.3 *Project Description*

Currently National Grid uses Microsoft Azure cloud service provider for provisioning infrastructure services, it is currently a manual process..

This project will use ServiceNow tool to build catalogue items and create cloud orchestration engine to enable desired target environments such as Dev (Development), QA (Test) and Prod (Production) environments to automatically provision infrastructure services

US Sanction Paper

- Build Service Catalogue items to “start”, “stop” & “terminate” the compute resources in Dev and QA environments.
- Identify who can request Cloud Services (i.e. Project Manager / Architect/ Program Delivery Manager of any application development team to request cloud services using Cloud Catalogue items in ServiceNow.
- Maintain user security among Dev, QA and Prod environments (This project will use the existing security controls and align with existing security tools).

Use Cloud Management module in ServiceNow to develop:

- Build two user interfaces (Admin and User portal) for Cloud Orchestration
- Enable Multi Factor Authentication (MFA) environments for Admin portal
- Enable Azure cloud services request to automatically update CMDB(Configuration Management Data Base). This module will reflect the Cloud Services in CMDB.

3.4 Benefits Summary

This project will build the following features in ServiceNow platform

- Automated provisioning templates
- Simplified approval process
- Automatic provision of cloud services
- Provisioning the cloud service provider on pay-as-you-use model
- Better user experience for enabling services

3.5 Business and Customer Issues

There are no significant business issues beyond what has been described elsewhere.

3.6 Alternatives

Alternative 1: Do Nothing - Not selected. This option does not address the potential to improve the turn around time for delivery of cloud hosting services. At present the service request can take over a week to be fulfilled. This is costly in project terms due to the manual and time consuming nature of the process. It delays project mobilization, is inefficient use of resources and slows delivery of end product. Building the cloud orchestration engine will eliminate wait time and improve efficiency.

Alternative 2: Defer investment - Not selected. Does not mitigate the risk to improve the provisioning time for cloud hosting.

US Sanction Paper

Alternative 3: Evaluate alternative third party vendors - Not Selected. National Grid already uses ServiceNow for its service request management (SRM) fulfillment. Leveraging the applications within the existing ServiceNow tool aligns with National Grid's SRM strategy. Evaluating additional third party vendors would mean a costly RFP process and incur additional onboarding costs. Adding a new vendor would increase development costs and incur additional RTB costs.

3.7 Safety, Environmental and Project Planning Issues

There are no significant issues beyond what has been described elsewhere.

3.8 Execution Risk Appraisal

Number	Detailed Description of Risk / Opportunity	Probability	Impact		Score		Strategy	Pre-Trigger Mitigation Plan	Residual Risk	Post Trigger Mitigation Plan
			Cost	Schedule	Cost	Schedule				
1	If Service Now is unable to support the full project scope then additional tools will need to be reviewed and there is an expectation of increased costs for tool analysis.	3	4	2	12	6	Mitigate	Have initial discussions with ServiceNow team and have the scope finalized and finalize if it could be delivered with the tool	N/A	Track the risk and evaluate the ServiceNow tool
2	If expertise is required, additional funds will be required to pay for these services.	2	3	5	6	10	Enhance	ServiceNow tools Professional services are considered for sanction process, based on further discussions with ServiceNow if the rates are changed it will be budgeted accordingly	N/A	Evaluate after the full sanction process
3	Project scope is not able to be delivered to all environments (i.e. production, dev, QA)	3	2	1	6	3	Mitigate	The project scope will be discussed with ServiceNow, Microsoft Azure, Oracle and VMWare teams to ensure all the environments are made available	N/A	Evaluate after the complete scope discussion with ServiceNow Professional team
4	Potential for increased RTB costs as RTB is currently not defined	1	3	1	3	1	Mitigate	RTB cost in not applicable for the project and will evaluate after post discussions with ServiceNow and Cloud Service Providers during Full Sanction Process	N/A	Evaluate after the full sanction process
5	Cloud provider must provide Service Management integration "hooks" at SRL, through API or other integration means.	3	4	4	12	12	Mitigate	All the stakeholders will be engaged and will be monitored to mitigate the risk by having frequent follow-up's with the team	N/A	Evaluate after the complete scope discussion with ServiceNow and Cloud Service Provider Professional team
6	Cloud provider can supply additional management tools or management service above the SRL	3	2	2	6	6	Mitigate	Additional management tools to be evaluated	N/A	Evaluate after the complete scope discussion with Cloud Service Provider Professional team

3.9 Permitting

N/A



US Sanction Paper

3.10 Investment Recovery

3.10.1 Investment Recovery and Regulatory Implications

Recovery will occur at the time of the next rate case for any operating company receiving allocations of these costs.

3.10.2 Customer Impact

N/A

3.10.3 CIAC / Reimbursement

N/A

3.11 Financial Impact to National Grid

3.11.1 Cost Summary Table

					Current Planning Horizon						
Project Number	Project Title	Project Estimate Level (%)	Spend (\$M)	Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	Total
					2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	
INVP 4981	Cloud Orchestration	Est Lvl (e.g. +/- 10%)	CapEx	0.000	0.130	0.389	0.000	0.000	0.000	0.000	0.518
			OpEx	0.000	0.193	0.194	0.000	0.000	0.000	0.000	0.388
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.000	0.323	0.583	0.000	0.000	0.000	0.000	0.906
Total Project Sanction			CapEx	0.000	0.130	0.389	0.000	0.000	0.000	0.000	0.518
			OpEx	0.000	0.193	0.194	0.000	0.000	0.000	0.000	0.388
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.000	0.323	0.583	0.000	0.000	0.000	0.000	0.906



US Sanction Paper

3.11.2 Project Budget Summary Table

Project Costs Per Business Plan

\$M	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
		2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	
CapEx	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.500
OpEx	0.000	0.250	0.350	0.000	0.000	0.000	0.000	0.600
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.500	0.600	0.000	0.000	0.000	0.000	1.100

Variance (Business Plan-Project Estimate)

\$M	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
		2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	
CapEx	0.000	0.120	(0.139)	0.000	0.000	0.000	0.000	(0.018)
OpEx	0.000	0.057	0.156	0.000	0.000	0.000	0.000	0.212
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.177	0.017	0.000	0.000	0.000	0.000	0.194

3.11.3 Cost Assumptions

- This estimate was developed in 2018 using the Standard IS Estimating Methodology. The accuracy level of estimate for the project is identified in Table 3.11.1 and 4.2.1 for development, integration and validation of Cloud Orchestration engine in ServiceNow tool.
- This investment will be managed by National Grid Project Manager.

3.11.4 Net Present Value / Cost Benefit Analysis

N/A

3.11.4.1 NPV Summary Table

N/A

US Sanction Paper**3.11.4.2 NPV Assumptions and Calculations**

N/A

3.11.5 Additional Impacts

N/A

3.12 Statements of Support**3.12.1 Supporters**

The supporters listed have aligned their part of the business to support the project.

Department	Individual	Responsibilities
Business Department	N/A	Business Representative
PDM	Helen Smith	Head of PDM
BRM	Caitlin Davidson	Relationship Manager
PDM	Chris Granata	Program Delivery Director
IT Finance	Michelle Harris	Manager
IT Regulatory	Dan DeMauro	Director
DR&S	Elaine Wilson	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Svetlana Lyba	Director

3.12.2 Reviewers

N/A

4 Appendices**4.1 Sanction Request Breakdown by Project**

N/A



US Sanction Paper

4.2 Other Appendices

4.2.1 Project Cost Breakdown

Project Cost Breakdown \$ (millions)					
Cost Category	sub-category	VOWD	FTC	FAC=VOWD+FTC	Name of Firm(s) providing
Personnel	NG Resources	0.009	0.188	0.197	
	SDC Time & Materials	0.000	-	-	IBM
		0.000	0.028	0.028	WiPro
		0.000	-	-	DXC
		0.000	-	-	Verizon
		0.000	-	-	IBM
	SDC Fixed-Price	0.000	-	-	WiPro
		0.000	-	-	DXC
		0.000	-	-	Verizon
	All other personnel	0.000	0.655	0.655	Cloud - Service Provider support
	TOTAL Personnel Costs	0.009	0.871	0.880	
Hardware	Purchase	0.000	-	-	
	Lease	0.000	-	-	
Software		0.000	-	-	
Risk Margin			-	-	
AFUDC		0.000	0.018	0.018	
Other		0.000	0.008	0.008	
TOTAL Costs		0.009	0.897	0.906	Should match Financial Summary Total



US Sanction Paper

4.2.2 Benefiting Operating Companies

Benefiting Operating Companies Table:

Operating Company Name	Business Area	State
Niagara Mohawk Power Corp.- Electric Distr.	Electric Distribution	NY
Massachusetts Electric Company	Electric Distribution	MA
KeySpan Energy Delivery New York	Gas Distribution	NY
KeySpan Energy Delivery Long Island	Gas Distribution	NY
Boston Gas Company	Gas Distribution	MA
Narragansett Electric Company	Electric Distribution	RI
Niagara Mohawk Power Corp. - Transmission	Transmission	NY
Niagara Mohawk Power Corp. - Gas	Gas Distribution	NY
New England Power Company – Transmission	Transmission	MA, NH, RI, VT
KeySpan Generation LLC (PSA)	Generation	NY
Narragansett Gas Company	Gas Distribution	RI
Colonial Gas Company	Gas Distribution	MA
Narragansett Electric Company – Transmission	Transmission	RI
National Grid USA Parent	Parent	
Nantucket Electric Company	Electric Distribution	MA
NE Hydro - Trans Electric Co.	Inter Connector	MA, NH
New England Hydro Finance Company Inc.	Inter Connector	MA, NH
KeySpan Energy Development Corporation	Non-Regulated	NY
KeySpan Port Jefferson Energy Center	Generation	NY
New England Hydro - Trans Corp.	Inter Connector	MA, NH
KeySpan Services Inc.	Service Company	
KeySpan Glenwood Energy Center	Generation	NY
Massachusetts Electric Company – Transmission	Transmission	MA
NG LNG LP Regulated Entity	Gas Distribution	MA, NY, RI
Transgas Inc	Non-Regulated	NY
Keyspan Energy Trading Services	Other	NY
KeySpan Energy Corp.	Service Company	
New England Electric Trans Corp	Inter Connector	MA

US Sanction Paper

4.2.3 IS Ongoing Operational Costs (RTB):

RTB impacts will be determined during R&D Phase

4.3 NPV Summary (if applicable)

N/A

4.4 Customer Outreach Plan

N/A



US Sanction Paper

Title:	SOE Windows Upgrade and Device Refresh	Sanction Paper #:	USSC-18-281
Project #:	INVP 4987 Capex: S007923	Sanction Type:	Partial Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	9/12/2018
Author:	Neha Verma / Andrew Yee	Sponsor:	Barry Sheils, VP Infrastructure and Operations
Utility Service:	IS	Project Manager:	Milena Passarelli

1 Executive Summary

1.1 **Sanctioning Summary**

This paper requests partial sanction of INVP 4987 in the amount \$0.601M with a tolerance of +/- 10% for the purposes of performing Requirements and Design (R&D) for SOE Windows Upgrade and Device Refresh project.

This sanction amount is \$0.601M broken down into:

\$0.547M Capex

\$0.054M Opex

\$0.000M Removal

NOTE: Potential investment is \$9.071M with a tolerance of +/- 25%, contingent upon submittal and approval of a Project Sanction paper following completion of Requirements and Design (R&D).

1.2 **Project Summary**

Currently, the standard operating environment (SOE) at National Grid is Windows 7, which Microsoft will not support or provide security patches for as of January 14, 2020. New PCs are dropping chipset support for Windows 7 install rendering the operating system obsolete. National Grid must upgrade the SOE to Windows 10.

To ensure the end user device estate continues to be reliable, remains secure and can meet new business demands, it is important that the operating system provides good performance and is fully supported by the software vendor. The current project will perform analysis of the current environment, gather requirements, and develop a design to roll out Windows 10 to all end users. The result will be provision of enhanced OS capabilities, better security and management of devices, and an improved user experience.



US Sanction Paper

Windows 10 upgrades will be a multi-year project and will require multiple sanctions.

1.3 Summary of Projects

Project Number	Project Type (Elec only)	Project Title	Estimate Amount (\$M)
4987		SOE Windows Upgrade and Device Refresh	9.071
Total			9.071

1.4 Associated Projects

N/A

1.5 Prior Sanctioning History

N/A

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
November 2018	Project Sanction

1.7 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input type="radio"/> Mandatory	<p>This is a policy driven project to upgrade Windows 7 to Windows 10.</p> <p>National Grid's strategy is to maintain operating systems are at currently supported levels. To ensure that the end user device estate continues to be reliable, remains secure and can meet new business demands, it is important that the operating system is capable of current performance and supported by the software vendor.</p>
<input checked="" type="radio"/> Policy- Driven	
<input type="radio"/> Justified NPV	
<input type="radio"/> Other	

1.8 Asset Management Risk Score

Asset Management Risk Score: 41



US Sanction Paper

Primary Risk Score Driver: (Policy Driven Projects Only)

☒ Reliability
☐ Environment
☐ Health & Safety
☐ Not Policy Driven

1.9 Complexity Level

☐ High Complexity
☒ Medium Complexity
☐ Low Complexity
☐ N/A

Complexity Score: 20

1.10 Process Hazard Assessment

A Process Hazard Assessment (PHA) is required for this project:

☐ Yes
☒ No

1.11 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
IS Investment Plan FY19-23	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Over <input checked="" type="radio"/> Under <input type="radio"/> NA	\$0.029M

1.12 If cost > approved Business Plan how will this be funded?

N/A

1.13 Current Planning Horizon

\$M	Prior Yrs	Current Planning Horizon						
		Yr. 1 2018/19	Yr. 2 2019/20	Yr. 3 2020/21	Yr. 4 2021/22	Yr. 5 2022/23	Yr. 6 + 2023/24	Total
CapEx	0.000	1.995	3.197	2.997	0.000	0.000	0.000	8.189
OpEx	0.000	0.191	0.394	0.297	0.000	0.000	0.000	0.882
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.000	2.186	3.591	3.294	0.000	0.000	0.000	9.071

US Sanction Paper**1.14 Key Milestones**

Milestone	Target Date: (Month Year)
Start Up	April 2018
Partial Sanction - Requirements and Design	September 2018
Project Sanction - Development and Implementation	November 2018
Project Go Live	January 2020
Project Complete	April 2020
Sanction Closure	June 2020

1.15 Resources, Operations and Procurement

Resource Sourcing			
Engineering & Design Resources to be provided	<input checked="" type="checkbox"/> Internal	<input type="checkbox"/> Contractor	
Construction/Implementation Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Resource Delivery			
Availability of internal resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Availability of external resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Operational Impact			
Outage impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Procurement Impact			
Procurement impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green

1.16 Key Issues (include mitigation of Red or Amber Resources)

N/A

1.17 Climate Change

Contribution to National Grid's 2050 80% emissions reduction target:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative
--	--	--------------------------------	--------------------------------

***US Sanction Paper***

Impact on adaptability of network for future climate change:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative
--	--	--------------------------------	--------------------------------

1.18 *List References*

N/A



US Sanction Paper

2 Decisions

I:

- (a) APPROVE this paper and the investment of \$0.601M and a tolerance of +/-10% for the purposes of - Requirements and Design.
- (b) NOTED the potential investment \$9.071M and a tolerance of +/- 25%, contingent upon submittal and approval of a Project Sanction paper following completion of requirements and design.
- (c) NOTED that Milena Passarelli is the Project Manager and has the approved financial delegation.

Signature.....Date.....

David H. Campbell, Vice President ServCo Business Partnering, USSC Chair

US Sanction Paper**3 Sanction Paper Detail**

Title:	SOE Windows Upgrade and Device Refresh	Sanction Paper #:	USSC-18-281
Project #:	INVP 4987 Capex: S007923	Sanction Type:	Partial Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	9/12/2018
Author:	Neha Verma / Andrew Yee	Sponsor:	Barry Sheils, VP Infrastructure and Operations
Utility Service:	IS	Project Manager:	Milena Passarelli

3.1 *Background*

Windows 7 is going out of support in January 14, 2020 and Microsoft will no longer provide patches and technical support to Windows 7 (Operating System) OS. To mitigate the risk of unsupported OS, the strategic plan is to convert approximately 32000 Windows 7 OS into Windows 10 OS.

In the future, as newer applications are introduced, the OS (Windows 10) will be able to run the newer applications which might not work on Windows 7. Security posture for the organization will remain high due to continued patching of security issues.

3.2 *Drivers*

The key drivers for this project are reliability, security and mitigation of risks of being on an out of support infrastructure. The project will eliminate potential security risks from the operation of Windows 7. The project will address avoiding loss of business operational capabilities if Windows 7 compatible devices cannot be found when a replacement is required. Additionally, new PCs purchased in the future will drop chipset support for installation of Windows 7. Therefore, National Grid must upgrade the SOE to Windows 10.

3.3 *Project Description*

This project will transform the current SOE at National Grid to the new Windows 10 OS provided by Microsoft.

The scope for the project includes:

- Estate discovery work to identify all hardware, users, and applications currently in the environment

US Sanction Paper

- Test lab configuration and expansion (to include all device types)
- Performance benchmarking
- Confirmation of SOE images
- Definition of scope and approach for applications testing and remediation
- Overall test strategy
- Identify most appropriate deployment method and recommendation for rollout of Windows 10 OS to all devices (approximately 32,000)
- Establish the ongoing support approach, model definition, and upgrade path
- Confirmation of D&I scope (based on estate discovery, requirements and design phase)

One of the main drivers of this project is to realize value as early as possible, as well as having a highly effective project team, closer alignment with the business and improved project visibility. This project will therefore be incorporating some agile techniques to achieve these goals. It is not expected that a full agile / scrum approach will be adhered to but the following main agile principles will be followed wherever possible:

- collaborative working
- iterative delivery
- business engagement
- flexibility to change and adapt
- frequent feedback loops

The project team will work with National Grid's designated supplier (DXC) to perform the following activities:

Phase 1 – Requirements and Design**Use of tools for estate discovery and technical analysis**

- Data gathering: hardware / users / applications
- Provide analysis on:
 - Application testing and prioritization
 - Infrastructure upgrade plan - define migration waves and rings (based on user's locations)
 - Age of hardware in National Grid, make/model numbers of hardware

Benchmarking Test Lab Setup

- Provide and/or validate final certified SOE images to be deployed
- Assist with benchmarking tests on all models used within National Grid

Application Testing

US Sanction Paper

- Create Application List from estate discovery
 - Identify each application
 - Classify operational / non-operational compatibility with Windows 10
 - Identify if the software has available patches or updates to bring into compliance/operation with Windows 10
 - Recommendations for application remediation

Deployment plan Windows 10 OS

- Propose deployment options (Early Adopter, Self-install, IS Install, Computer Exchange)
- Make Early Adopter images available to the user community with associated documentation; work with test resources to capture data
- Capacity planning for deployment
- Training plan for Tech Bar Support – align to BAU training processes and KB dissemination
- High Level schedule
- Image new devices used for R&D efforts

Post Implementation Support

- Define and provide post implementation support model
- Define maintenance model

Not in Scope:

- Excludes Cadent and Xoserve devices
- Excludes mass device refresh
- Excludes configuration of a Windows Store for National Grid
- Field Devices may not be in scope if the field applications are not compatible with Windows 10
- Call Centers Upgrade (this will be treated in a separate project)

3.4 Benefits Summary

Once implemented, the Windows 10 upgrade project will:

- Provide a fully supported operating system for end user devices with functional benefits improving employee's effectiveness
- Mitigate cyber security risk associated with running un-patchable software
- Increase security from newer applications, as all the latest critical security patches and upgrades should be utilized in full across all devices in the network

US Sanction Paper

3.5 Business and Customer Issues

There are no significant business issues beyond what has been described elsewhere.

3.6 Alternatives

Alternative 1: Do Nothing

Choosing to continue to run an unsupported OS will potentially raise security risks, reliability and productivity issues. Once Windows 7 becomes an obsolete system, Microsoft will not make any security patches or fixes for the OS. Therefore, this was rejected.

Alternative 2: Defer Project

Deferring the project will delay the realization of benefits of ensuring that operating systems at National Grid are maintained at current supported levels, and that the end user device estate continues to be reliable, remains secure and can meet new business demands.

3.7 Safety, Environmental and Project Planning Issues

NA

3.8 Execution Risk Appraisal

Number	Detailed Description of Risk / Opportunity	Probability	Impact		Score		Strategy	Pre-Trigger Mitigation Plan	Residual Risk	Post Trigger Mitigation Plan
			Cost	Schedule	Cost	Schedule				
1	System Integrator encounters capacity and resource issues delaying R&D phase of effort	3	5	4	15	12	Accept	Partner with SI to ensure smooth execution via milestones and performance reviews		Engagement of commercial team to replace provider
2	Business using non-IS supported applications which may not work on Win 10. IS may have no knowledge of these apps before deployment	3	1	2	3	6	Transfer	Communicate with Business and request application to be replaced	Business not able to replace application	Business to provide funds/solution for fix.
3	Existing National Grid infrastructure does not have the capabilities to perform estate discovery or deploy Windows 10 related packages requiring rearchitecture	4	5	5	20	20	Mitigate	Perform review of deployment infrastructure with SI		Architect a solution, deploy infrastructure updates

3.9 Permitting

N/A



US Sanction Paper

3.10 Investment Recovery

3.10.1 Investment Recovery and Regulatory Implications

Recovery will occur at the time of the next rate case for any operating company receiving allocations of these costs.

3.10.2 Customer Impact

N/A

3.10.3 CIAC / Reimbursement

N/A

3.11 Financial Impact to National Grid

3.11.1 Cost Summary Table

					Current Planning Horizon						
Project Number	Project Title	Project Estimate Level (%)	Spend (\$M)	Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	Total
					2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	
4987	SOE Windows Upgrade and Device Refresh	Est Lvl (e.g. +/- 25%)	CapEx	0.000	1.995	3.197	2.997	0.000	0.000	0.000	8.189
			OpEx	0.000	0.191	0.394	0.297	0.000	0.000	0.000	0.882
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.000	2.186	3.591	3.294	0.000	0.000	0.000	9.071
Total Project Sanction			CapEx	0.000	1.995	3.197	2.997	0.000	0.000	0.000	8.189
			OpEx	0.000	0.191	0.394	0.297	0.000	0.000	0.000	0.882
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.000	2.186	3.591	3.294	0.000	0.000	0.000	9.071

3.11.2 Project Budget Summary Table

Project Costs Per Business Plan

	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
\$M		2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	
CapEx	0.000	2.000	3.200	3.000	0.000	0.000	0.000	8.200
OpEx	0.000	0.200	0.400	0.300	0.000	0.000	0.000	0.900
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	2.200	3.600	3.300	0.000	0.000	0.000	9.100

Variance (Business Plan-Project Estimate)

US Sanction Paper

\$M	Prior Yrs (Actual)	Current Planning Horizon						
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	Total
		2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	
CapEx	0.000	0.005	0.003	0.003	0.000	0.000	0.000	0.011
OpEx	0.000	0.009	0.006	0.003	0.000	0.000	0.000	0.018
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.014	0.009	0.006	0.000	0.000	0.000	0.029

3.11.3 Cost Assumptions

N/A

3.11.4 Net Present Value / Cost Benefit Analysis**3.11.4.1 NPV Summary Table**

N/A

3.11.4.2 NPV Assumptions and Calculations

N/A

3.11.5 Additional Impacts**3.12 Statements of Support****3.12.1 Supporters**

The supporters listed have aligned their part of the business to support the project.

Department	Individual	Responsibilities
Business Department	Martin Evans	Business Representative
PDM	Helen Smith	Head of PDM
BRM	Brian Detota	Relationship Manager
PDM	Ken Wermann	Program Delivery Director
IS Finance	Michelle Harris	Manager
IS Regulatory	Dan DeMauro	Director
DR&S	Elaine Wilson	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Svetlana Lyba	Director



US Sanction Paper

3.12.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Function	Individual
Regulatory	Harvey, Maria
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Currie, John
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego

4 Appendices

4.1 Sanction Request Breakdown by Project

\$M	4987	Proj Num	Proj Num	Proj Num	Proj Num	Proj Num	Proj Num	Proj Num	Proj Num	Total
CapEx	0.547									0.547
OpEx	0.054									0.054
Removal										0.000
Total	0.601	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.601

4.2 Other Appendices

4.2.1 Project Cost Breakdown

US Sanction Paper

Project Cost Breakdown \$ (millions)					
Cost Category	sub-category	VOWD	FTC	FAC=VOWD+FTC	Name of Firm(s) providing resources
Personnel	NG Resources	0	0.238	0.238	
	SDC Time & Materials	0	0.006	0.006	IBM
		0	-	-	WiPro
		0	-	-	DXC
		0	-	-	Verizon
	SDC Fixed-Price	0	-	-	IBM
		0	-	-	WiPro
		0	0.163	0.163	DXC
		0	-	-	Verizon
	All other personnel	0	0.031	0.031	
	TOTAL Personnel Costs	0.0315	0.438	0.470	
Hardware	Purchase	0	-	-	
	Lease	0	-	-	
Software		0	0.000	0.000	
Risk Margin			0.101	0.101	
AFUDC		0	0.101	0.101	
Other		0	8.399	8.399	
	TOTAL Costs	0.032	9.039	9.071	

4.2.2 Benefiting Operating Companies

Benefiting Operating Companies	Allocation
National Grid USA Parent	0.42%
KeySpan Energy Corp.	0.08%
Niagara Mohawk Power Corp.- Electric Distr.	15.59%
Niagara Mohawk Power Corp. - Gas	4.53%
Niagara Mohawk Power Corp. - Transmission	5.54%
KeySpan Energy Delivery New York	13.31%
KeySpan Energy Delivery Long Island	8.29%
Massachusetts Electric Company	19.54%
Massachusetts Electric Company - Transmission	0.20%
Nantucket Electric Company	0.25%
Boston Gas Company	8.59%
Colonial Gas Company	1.89%
Narragansett Electric Company	7.22%



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Narragansett Gas Company	2.73%
Narragansett Electric Company - Transmission	1.97%
New England Power Company - Transmission	5.05%
NE Hydro - Trans Electric Co.	0.21%
New England Hydro - Trans Corp.	0.11%
New England Electric Trans Corp	0.00%
NG LNG LP Regulated Entity	0.19%
KeySpan Generation LLC (PSA)	3.54%
KeySpan Glenwood Energy Center	0.11%
KeySpan Port Jefferson Energy Center	0.12%
Keyspan Energy Trading Services	0.00%
Transgas Inc	0.09%
KeySpan Energy Development Corporation	0.29%
KeySpan Services Inc.	0.14%
Total	100.00%

4.2.3 IS Ongoing Operational Costs (RTB):

Note :- RTB impacts will be determined as part of the R&D phase.

4.3 NPV Summary (if applicable)


N/A

4.4 Customer Outreach Plan

N/A

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eSanction Form - USSC - 4987-SOE Windows Upgrade and Device Refresh (Development and Implementation) Partial Sanction-2019-0

Long: US Sanction Paper			
Title:	SOE Windows Upgrade and Device Sanction Paper #: USSC-18-281 v2		
Project #:	INVP 4987	Sanction Type:	Partial Sanction
Capex #:	S007923		
Operating Company:	National Grid USA Svc. Co.	Date of Request:	8/14/2019
Author:	Musacchia, Joseph Cappiello, Gina McDonnell, Brian	Sponsor(s):	Olive, Stephen Chief Information Officer
Utility Service:	IT	Project Manager:	Musacchia, Joseph

Executive Summary

This paper requests Partial Sanction of 4987 in the amount of \$4.385M with a tolerance of +/-10% for the purposes of Requirements and Design.

This paper requests Partial Sanction of INVP 4987 in the amount of \$4.385M with a tolerance of +/-10% for the purposes of Requirements and Design.

This sanction amount is \$4.385M broken down into:

\$4.368M Capex
\$0.017M Opex
\$0.000M Removal

NOTE the potential investment of \$9.071M with a tolerance of +/-25%, contingent upon submittal and approval of a Project Sanction paper following completion of Requirements and Design.

Project Summary

Due to Windows 7 going out of support (January 14, 2020), the Windows 10 upgrade becomes necessary to meet the requirement to ensure the end user device estate continues to be reliable, remains secure and can support new business demands. It is also important that the operating system is capable of current performance and is supported by the software vendor, as no more security patches will be provided for Windows 7.

This sanction paper is to request funds for the Requirements & Design stage (partial sanction) of a program which will deliver enhanced capabilities and ensure the estate continues to operate as required. In order to achieve these goals, both the UK and US program need to complete their initiatives.

Background

Windows 7 is going out of support in January 14, 2020 and Microsoft will no longer provide patches and technical support to Windows 7 (Operating System) OS. To mitigate the risk of unsupported OS, the strategic plan is to convert Windows 7 OS devices into Windows 10 OS devices. In the future, as newer applications are introduced, the OS (Windows 10) will be able to run the newer applications which might not work on Windows 7. Security posture for the organization will remain high due to continued patching of security issues.

Project Description

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Information Technology Capital Investment Quarterly Report

Fourth Quarter Ended August 31, 2019

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Scope:

Investment paper 1

The overall scope of this project is to roll out Windows 10 to approximately 14,000 US end user laptop and desktop PCs to provide enhanced OS (Operational System) capabilities, security and management of devices, and improved user experience. Windows 10 upgrade will be a multiple year project and will require multiple sanctions to fund the various phases of the project.

The scope for this sanction is: R&D Phase 1 – Deployment of Win10 using Agile-Kanban Approach

- Deploy Windows 10 up to 1500 users / 12% of the estate
- Groups devices in the estate based on complexity (Epics)
- Group users based on agreed criteria such as geographic location etc. (Features)
- Purchase 1,500 laptops and deploy
- 5,000 laptops across the estate are not able to support Windows 10
- 3,500 laptops are being replaced by Legacy device replacement project
- Purchase memory for 1,500 laptops - they currently have insufficient memory to run Win 10
- Deploy capabilities / tools to enable PXE Boot
- Complete new image and define new image process
- Create Complete Solution Design Document for Windows 10 Deployment
- Enable Windows 10 supporting teams (Help Desk, Tech Bar, Field Forces and Executive Support)
- Communication to all users and application owners
- Windows 10 Deployment to users defined by the Features
- Service Transition Activities
- Application rationalization
- Complete apps remediation and test plan
- Application packaging for the new SCCM (System Center Configuration Manager) environment
- Setup Microsoft Evergreen and Autopilot processes

Work done:

Work done during the R&D phase is detailed below

- Estate discovery: Some estate discovery work was completed with DXC, however this did not meet National Grid requirements. Additional estate discovery work will take place during this phase.
- Benchmarking test lab: Some benchmark tests completed and basic hardware requirements defined
- Application testing: Applications identified as part of the SOE have been tested and a new Windows 10 SOE has been created, tested and under final approval with Security.
- Early adopters: The project was not able to deploy to early adopters due to the issues with the estate discovery work. Also, necessary tools are not in place to allow early adopter deployment – this was discovered during the R&D stage
- Deployment plan: Agreed use of Agile deployment and completed initial agile planning sessions
- Communications and business change: Business engagement has commenced within IT
- Post implementation support: Post implementation support model definition has commenced.

Approach:

One of the main drivers of the Agile-Scrum-Kanban approach is to realize value as early as possible as well as having highly efficient project team, closer alignment with the business and improved project visibility. Agile-Scrum-Kanban will use dashboards to monitor progress and will constantly validate assumptions relying on the following processes:

- Collaborative working
- Iterative delivery
- Business engagement
- Frequent feedback loops
- Flexibility to change and adapt

Action:

- The Requirements & Design phase 1 will run from August 2018 to September 2019 (inclusive)
- The Deployment & Implementation phase will run from October 2019 to March 2020 (inclusive)
- The project will adopt an Agile-Scrum-Kanban approach which will allow earlier deployment, starting with smaller groups of deployments in order to apply lessons learned methodology and improve deployments for next groups
- It will be a scaled deployment plan, improving services and user experience in each feature (deployment)

Result:

The outcome of this stage will

- Project team will be trained how to use the Microsoft Analytics tool – this will support estate discovery
- Finalize deployment plan
- Deploy to early adopters
- Deploy to users who do not have complex apps which require remediation
- Application validation
- Finalize application remediation and test plans
- Commence evergreen and autopilot discussions to determine the way forward

Summary of Benefits

Once implemented, the Windows 10 upgrade project will:

- Provide a fully supported operating system for end user devices with functional benefits improving employee's effectiveness
 - Mitigate cyber security risk associated with running un-patchable software
 - Increase security from newer applications, as all the latest critical security patches and upgrades should be utilized in full across all devices in the network
-

Business and Customer Issues

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There are no significant business or customer issues beyond what has been described elsewhere

Alternatives

Number	Title
1	Alternative 1: Stop the program Choosing to continue to run an unsupported operating system (OS) will potentially increase the s Indicative cost: N/A
2	Alternative 2: Defer Project Deferring the project will delay the realization of benefits of ensuring that operating systems at Na Indicative cost:\$11.425/ with a tolerance of +/-25%

Related Projects, Scoring and Budget

Summary of Projects

Project Number	Project Type (Elec only)	Project Title	Estimate Amount(\$M)
4987		SOE Windows Upgrade and Device Refresh	9.071
Total:			9.071

Associated Projects

Project Number	Project Title	Estimate Amount (\$M)
N/A	N/A	0.000

Prior Sanctioning History

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Sanction Type	Sanction Paper	Potential Investment Tolerance
8/23/2018	USSC	0.601	9.071	Partial Sanct	USSC-18-281	25%

Key Milestones

Milestone	Date (Month / Year)
Start Up	April, 2018
Partial Sanction	August, 2018
Begin Requirements and Design	September, 2018
Partial Sanction	August, 2019
Cont'd Requirements and Design	September, 2019
Project Sanction	October, 2019
Begin Development and Implementation	October, 2019
Move to Production / Final Go Live	January, 2020
Project Closure Sanction	March, 2020

Next Planned Sanction

Date (Month/Year)	Purpose of Sanction Review
October, 2019	Sanction

Category

Category	Reference to Mandate, Policy, NPV, or Other
<input type="radio"/> Mandatory	IT BMS Standard 3.4 Maintain all IT assets and services within the control of Global IT Service Delivery.
<input checked="" type="radio"/> Policy-Driven	
<input type="radio"/> Justified NPV	

Asset Management Risk Score: 41

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PRIMARY RISK SCORE DRIVER

☒ Reliability ☐ Environment ☐ Health & Safety ☐ Not Policy Driven

Complexity Level: 20

☐ High Complexity ☒ Medium Complexity ☐ Low Complexity ☐ N/A

Process Hazard Assessment

A Process Hazard Assessment (PHA) is required for this project: ☐ Yes ☒ No

Current Planning Horizon

Capex	0.488	8.522	0.000	0.000	0.000	0.000	0.000	9.010
Opex	0.028	0.033	0.000	0.000	0.000	0.000	0.000	0.061
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.516	8.555	0.000	0.000	0.000	0.000	0.000	9.071

Resources, Operations, & Procurement

RESOURCE SOURCING

Engineering & design Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor
Construction/Implementation Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor

RESOURCE DELIVERY

Availability of internal resources to delivery project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Availability of external resources to delivery project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green

OPERATIONAL IMPACT

Outage impact on network system	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
---------------------------------	---------------------------	-----------------------------	--

PROCUREMENT IMPACT

Procurement impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
---------------------------------------	---------------------------	-----------------------------	--

Key Issues

- Impact of MWS (Managed Workspace Services) Contract** - There is a risk the project may be delayed due to the ongoing MWS contract negotiations. Working with partners to ensure resources and smooth execution. Hardware refresh values have not been finalized. They will be updated and validated for the final sanction paper which may increase/decrease costs
- Lack of resources** - Requesting/requiring full commitment of time for any staff assigned to Win10 Upgrade project.
- Defining application baseline scope** - Engaged CT Global to analyze full NG application estate. Staffed an Application Test/Remediation scrum team to identify incompatible applications and to recommend remediation. Staffed a Planning scrum team to manage recommend and collaborate with activities outside of the scope of the 4987 project.

Climate Change

Contribution to National Grid's 2050 80% emissions reduction target: ☒ Neutral ☐ Positive ☐ Negative

Impact on adaptability of network for future climate change: ☒ Neutral ☐ Positive ☐ Negative

List References

N/A

Permitting

N/A

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Investment Recovery and Customer Impact

Investment Recovery

Recovery will occur at the time of the next rate case for any operating company receiving allocations of these costs.

Customer Impact

N/A

Execution Risk Appraisal

Risk Breakdown Structure Category	Qualitative Assessment / Risk Response Strategy				Risk Score
	Risk ID + Title	IF Statement	THEN Statement	Risk Response Strategy	
1. Project Requirements	R1 - Application incompatibility	Applications which are discovered to be incompatible with the Windows 10 OS are not remediated 2-3 months prior to the end of FY20	There will not be sufficient time to schedule, communicate to users and deploy the affected users' Windows 10 OS upgrade	Reduce	20
1. Project Requirements	R2 - Refresh machine budget	Funding is not approved to refresh old model workstations (in use for over 3 years)	The deployment methods to be used to upgrade users will need to change to a more labor intensive method and will increase the project cost and/or put at risk completion of the target upgrade population in time to meet the mandated project deadline.	Avoid	9
1. Project Requirements	R3 - Resource commitment	National Grid staff resources are not fully dedicated to the Agile-Scrum teams responsible for performing to this project	This project will not be able to be considered Agile, and the work performed is at risk of not being performed to the date, cost, quality and schedule goals of this project	Avoid	6

Business Plan

Business Plan Name & Period (BP 18)	Project Included in approved Business Plan?	(Over) / Under Business Plan	Project Cost relative to approved Business Plan (\$M)
IT Approved Business Plan	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> N/A	(6.093)
If Cost > Approved			

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if costs > approved Business Plan how will this be funded?

3. Re-allocation of budget from within the IT business has been managed to meet jurisdictional budgetary, statutory and regulatory requirements.

Drivers

The key drivers for this project are reliability, security and mitigation of risks of being on an out of support infrastructure. The project will eliminate potential security risks from the operation of Windows 7. The project will address avoiding loss of business operational capabilities if Windows 7 compatible devices cannot be found when a replacement is required. Additionally, new PCs purchased in the future will drop chipset support for installation of Windows 7. Therefore, National Grid must upgrade the SOE to Windows 10.

CIAC Reimbursement

N/A

Cost Summary Table

Project Number	4987	Project Title	SOE Windows Upgrade and Device Refresh						Project Estimate Level
Spend	Prior Yrs	Yr 1 2020	Yr 2 2021	Yr 3 2022	Yr 4 2023	Yr 5 2024	Yr 6 2025	Total	
Capex	0.488	8.522	0.000	0.000	0.000	0.000	0.000	9.010	
Opex	0.028	0.033	0.000	0.000	0.000	0.000	0.000	0.061	
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Total	0.516	8.555	0.000	0.000	0.000	0.000	0.000	9.071	

Total Project Sanction

Capex	0.488	8.522	0.000	0.000	0.000	0.000	0.000	9.010
Opex	0.028	0.033	0.000	0.000	0.000	0.000	0.000	0.061
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.516	8.555	0.000	0.000	0.000	0.000	0.000	9.071

Project Costs per Business Plan

\$M	Prior Yrs	Yr 1 2020	Yr 2 2021	Yr 3 2022	Yr 4 2023	Yr 5 2024	Yr 6 2025	Total
Capex	0.488	2.034	0.000	0.000	0.000	0.000	0.000	2.522
Opex	0.028	0.428	0.000	0.000	0.000	0.000	0.000	0.456
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.516	2.462	0.000	0.000	0.000	0.000	0.000	2.978

Variance

\$M	Prior Yrs	Yr 1 2020	Yr 2 2021	Yr 3 2022	Yr 4 2023	Yr 5 2024	Yr 6 2025	Total
Capex	0.000	(6.488)	0.000	0.000	0.000	0.000	0.000	(6.488)
Opex	0.000	0.395	0.000	0.000	0.000	0.000	0.000	0.395
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Variance	0.000	(6.093)	0.000	0.000	0.000	0.000	0.000	(6.093)

Sanction Request Breakdown by Project

Project Number	Capex	Opex	Removal	Total
4987				0.000

Cost Assumptions

The accuracy level of estimate for each project is identified in the Cost Summary Table

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Net Present Value / Cost Benefit Analysis

N/A

NPV Assumptions & Calculations

N/A

Additional Impacts

The new MWS (Work Space Services) Provider.

Statement of Support

Department	Individual	Responsibilities
Business Department	Olive, Stephen	Business Representative
Business Partner (BP)	Davidson, Caitlin	Relationship Manager
Program Delivery Management (PDM)	Wermann, Kenneth	Program Delivery Director
IT Finance	Harris, Michelle	Manager
IT Regulatory	DeMauro, Daniel J.	Director
Digital Risk and Security (DR&S)	Shattuck, Peter	Manager
Service Delivery	Mirizio, Mark	Principal Analyst
ARB Verification	Clinchot, Joseph J.	Director
Enterprise Portfolio Management	Cronin, Daniel	Analyst

Reviewers

Function	Individual
Regulatory	Mancinelli, Lauri A.
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Smith, Amy
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego

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Decisions

Fourth Quarter Ended August 31, 2019

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- (a) APPROVE the investment of \$4.385M and a tolerance of +/-10% for Requirements and Design.
- (b) NOTED the potential investment of \$9.071M and a tolerance of +/-25%%, contingent upon submittal a
- (c) NOTED that Musacchia, Joseph has the approved financial delegation to undertake the activities state

Signature _____

Date _____

Christine McClure, Vice President, Finance Business Partner Service Company, USSC Chair

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Appendix

PROJECT COST BREAKDOWN \$ (MILLIONS)					
COST CATEGORY	SUB-CATEGORY	VALUE OF WORK TO DATE (VOWD)	FORECAST TO COMPLETE (FTC)	FORECAST AT COMPLETION (FAC=VOWD+FTC)	NAME OF FIRM(S) PROVIDING RESOURCES
PERSONNEL	NG RESOURCES		0.565	0.565	
	SDC TIME & MATERIALS		-	-	IBM
			-	-	WIPRO
			-	-	DXC
			-	-	VERIZON
			-	-	
	SDC FIXED-PRICE		-	-	IBM
			-	-	WIPRO
			-	-	DXC
			-	-	VERIZON
	ALL OTHER PERSONNEL		1.929	1.929	
	TOTAL PERSONNEL COSTS	-	2.495	2.495	
HARDWARE	PURCHASE		5.677	5.677	
	LEASE		-	-	
SOFTWARE			-	-	
RISK MARGIN			-	-	
AFUDC			0.119	0.119	
OTHER			0.080	0.080	
TOTAL COSTS		-	8.370	8.370	

COSEG	COMPANY NAME	SAP CO.	SAP SEG	JURISDICTION	BU
5020R	NATIONAL GRID USA PARENT	5020	PARENT	PARENT	
5040R	KEYSPAN ENERGY CORP.	5040	PARENT	PARENT	
5210E	NIAGARA MOHAWK POWER CORP. - ELECTRIC DISTR.	5210	NYELEC	NY	ELECTRIC
5210G	NIAGARA MOHAWK POWER CORP. - GAS	5210	NYGASD	NY	GAS
5210T	NIAGARA MOHAWK POWER CORP. - TRANSMISSION	5210	NYTRAN	NY	TRANSMISSION
5220G	KEYSPAN ENERGY DELIVERY NEW YORK	5220	NYGASD	NY	GAS
5230G	KEYSPAN ENERGY DELIVERY LONG ISLAND	5230	NYGASD	NY	GAS
5310E	MASSACHUSETTS ELECTRIC COMPANY	5310	MAELEC	MA	ELECTRIC
5310T	MASSACHUSETTS ELECTRIC COMPANY - TRANSMISSION	5310	FRTRAN	FERC	TRANSMISSION
5320E	NANTUCKET ELECTRIC COMPANY	5320	MAELEC	MA	ELECTRIC
5330G	BOSTON GAS COMPANY	5330	MAGASD	MA	GAS
5340G	COLONIAL GAS COMPANY	5340	MAGASD	MA	GAS
5360E	NARRAGANSETT ELECTRIC COMPANY	5360	RIELEC	RI	ELECTRIC
5360G	NARRAGANSETT GAS COMPANY	5360	RIGASD	RI	GAS
5360T	NARRAGANSETT ELECTRIC COMPANY - TRANSMISSION	5360	FRTRAN	FERC	TRANSMISSION
5410T	NEW ENGLAND POWER COMPANY - TRANSMISSION	5410	FRTRAN	FERC	TRANSMISSION
5411F	NE HYDRO - TRANS ELECTRIC CO.	5411	FRELEC	FERC	TRANSMISSION - HYDRO
5412F	NEW ENGLAND HYDRO - TRANS CORP.	5412	FRELEC	FERC	TRANSMISSION - HYDRO
5413F	NEW ENGLAND ELECTRIC TRANS CORP.	5413	FRELEC	FERC	TRANSMISSION - HYDRO

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5420G	NG LNG LP REGULATED ENTITY	5420	ERGASO	FERC	GAS
5430P	KEYSPAN GENERATION LLC (PSA)	5430	FRPGEN	FERC	TRANSMISSION
5431P	KEYSPAN GLENWOOD ENERGY CENTER	5431	FRPGEN	FERC	TRANSMISSION
5432P	KEYSPAN PORT JEFFERSON ENERGY CENTER	5432	FRPGEN	FERC	TRANSMISSION
5820N	KS ENERGY TRADING	5820	PARENT	PARENT	
5825N	TRANSGAS INC	5825	NONREG	NONREG	
5840N	KEYSPAN ENERGY DEVELOPMENT CORPORATION	5840	NONREG	NONREG	
5850N	KEYSPAN SERVICES INC.	5850	NONREG	NONREG	

ALL FIGURES IN \$ THOUSANDS	YR. 1 FY 19/20	YR. 2 FY 20/21	YR. 3 FY 21/22	YR. 4 FY 22/23	YR. 5 FY 23/24	TOTAL
LAST SANCTIONED NET IMPACT TO RTB						
LAST SANCTION IS NET IMPACT TO RTB						-
LAST SANCTION BUSINESS NET IMPACT TO RTB						-
LAST SANCTION TOTAL NET IMPACT TO RTB	-	-	-	-	-	-
PLANNED/BUDGETED NET IMPACT TO RTB						
IS INVESTMENT PLAN NET IMPACT TO RTB						-
BUSINESS BUDGETED NET IMPACT TO RTB						-
CURRENTLY FORECASTED NET IMPACT TO RTB						
IS FUNDED NET IMPACT TO RTB FORECASTED AT GO-LIVE	-	-	-	-	-	-
BUSINESS FUNDED NET IMPACT TO RTB FORECASTED AT GO-LIVE	-	-	-	-	-	-
VARIANCE TO PLANNED/BUDGETED NET IMPACT TO RTB						
IS INVESTMENT PLAN NET IMPACT TO RTB VARIANCE	-	-	-	-	-	-
BUSINESS BUDGETED NET IMPACT TO RTB VARIANCE	-	-	-	-	-	-